

**A QUALITATIVE INVESTIGATION OF THE ROLE OF FOOD WORKERS IN
U.S. FOOD SAFETY**

by
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ABSTRACT

Food safety requires that food producers, processors, distributors, and retailers assure the public of a food supply that is safe, of wholesome quality, and managed under sanitary conditions. Our global, industrial food system makes this task a challenge, however, and foodborne disease represents a significant problem in the United States. To close the gap between actual and desired food safety performance, stakeholders must consider the role of various parts of the food system, including workers, who impact the food supply through health and behavior. Research examining the relationship between work and health suggests a role for working conditions in shaping workers' proper food safety practice. Despite this evidence, food workers experience poor wages and working conditions. The division between food safety goals and the state of food work suggests a need to review how we define the relationship between food workers and safety, and to consider how this definition may include the working conditions that put workers and food at risk.

This dissertation uses a qualitative approach to describe the role of food workers in food safety as constructed by federal food safety regulations and as perceived by food workers in the context of their everyday lives and work experiences. This research also explores the perspectives of representatives from key stakeholder groups to identify opportunities and challenges for advancing poor food working conditions as an issue of food safety on the public policy agenda.

Findings suggest that a modern and prevention-oriented U.S. food safety system places little emphasis on workers' social and structural context, including poor food working conditions, in accounting for worker-related food safety. In contrast, workers are

largely defined and managed as sources of contamination through individual factors, such as a lack of food safety knowledge and skills that may be intervened upon through training. These legal constructions of the issue contrast with food workers' identification of a range of factors, at multiple levels, that are perceived to impact proper food safety practice. According to key stakeholder groups, addressing this gap may be complex, and revolve around effectively communicating the connection among issues while also protecting food workers and advancing their wellbeing. Despite these challenges, recommendations are made regarding where, how, and with whom public health advocates may begin to advance this issue on the public policy agenda.

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CHAPTER 1. INTRODUCTION

1.1 Statement of the Problem

Foodborne disease represents a significant and preventable public health problem in the United States (Centers for Disease Control and Prevention, 2011d). Over the last 15 years, progress in addressing the problem has been stagnant (Centers for Disease Control and Prevention, 2011d). According to the Centers for Disease Control and Prevention, most outbreaks are associated with workers' hygiene and improper food handling behaviors (Centers for Disease Control and Prevention, 2011a). Disconnected from and relevant to these data is a growing literature describing food workers as a socially vulnerable population in jobs that compromise health and performance. In one study of workers across the food chain, 79% reported lacking paid sick days, 83% reported a lack of employer health insurance, and 86% reported earning low or poverty wages (Food Chain Workers Alliance, 2012). More than half reported working while sick, indicating that they could not afford to take time off or feared being fired if they did. Workers also explained that strenuous work environments prolonged illnesses and challenged their ability to perform jobs adequately and safely (Food Chain Workers Alliance, 2012). These data suggest a divide between U.S. food safety goals and worker-related food safety influences. To reconcile this gap, we must first establish how we define the relationship between workers and food safety and examine how this definition may consider the social and occupational context that puts workers and food at risk.

1.2 Specific Aims and Research Questions

In this dissertation, I explore the role of food workers in food safety as constructed by a variety of key perspectives, including within the U.S. food safety

system, according to food workers, and from the viewpoint of key issue stakeholders. To accomplish this goal, the study includes three specific aims. Aim 1 is to describe the role of workers in FDA proposed regulations to implement the 2011 Food Safety Modernization Act (FSMA)—the legal foundation of a new, prevention-based food safety system in the U.S. Aim 2 is to explore Baltimore food service worker perceptions of workers' food safety role in the context of their lives and working conditions. Of particular interest is how worker perceptions relate to this role as defined by proposed food safety regulations (Aim 1). Aim 3 is to identify key stakeholder perceptions about advancing poor food working conditions as an issue of food and public safety on the public policy agenda. Findings from Aim 3 may inform reporting on worker interviews (Aim 2) and recommendations for considering working conditions in U.S. food safety strategies (Aim 1). The study aims and research questions are as follows:

Aim 1: To describe the role of food workers in food safety as defined by the U.S. food safety system (FDA proposed regulations implementing the 2011 FSMA)

- *Research Question 1:* How are food workers defined as hazards to food safety (sources of contamination)?
- *Research Question 2:* What controls are proposed to manage these hazards (including development, implementation, and enforcement)?

Aim 2: To explore food worker perceptions of the food safety role within the broader context of workers' lives and work in Baltimore, Maryland.

- *Research Question 1:* How do Baltimore food service workers describe proper food safety practice in relation to food working conditions?

Aim 3: To identify key stakeholder perceptions about advancing poor food working conditions as an issue of food safety on the public policy agenda.

- *Research Question 1:* How do key stakeholder groups engage with U.S. food working conditions as an issue of food and public safety?
- *Research Question 2:* What are key stakeholder perceptions on the challenges and opportunities for advancing this issue on the public policy agenda?

1.3 Approach

The study's specific aims are organized and achieved through three research phases:

Phase 1: Document Review

The first phase will be an analysis of the worker-relevant content of FDA proposed regulations to implement the 2011 Food Safety Modernization Act (FSMA). These documents outline requirements and standards for a prevention-based food safety system, including the role of food workers in this process. The analysis will focus on identifying the themes and discourse relevant to food workers. Findings from this phase are expected to illustrate how the U.S. food safety system currently defines workers as both a risk to and as controllable in ensuring safe food.

Phase 2: Food Worker Interviews

The second research phase involves food worker interviews, guided by vignettes, to explore the relationships among working conditions and food safety practices as they are meaningful to food workers. Criteria-based selection is used to identify workers who regularly handle food in food service, or the sector where workers are most commonly implicated as a source of foodborne outbreaks (Gould, Rosenblum, Nicholas, Phan, & Jones, 2013). By triangulating these data with documents in phase 1, phase 2 findings complement the role of workers as defined by the food safety system with the perceptions of this role as defined in the context of workers' lives and working conditions.

Phase 3: Key Stakeholder Interviews

The third research phase involves key stakeholder interviews to inform and identify strategies for advancing the relationship between poor food working conditions and food

safety on the public policy agenda. Findings from this phase may help to identify opportunities and challenges associated with communicating the issues under study so that they both support a role for good working conditions in food safety while also minimizing blame or other negative impacts for food workers.

1.4 Public Health Significance

The relationship between food work and food safety is not adequately explored in the literature. A number of reports from worker advocate groups have started to warn of the intersection of poor working conditions and food safety. This work has not yet established a framework to help understand and consider the current state of the issue. This dissertation contributes to the literature by illuminating how the U.S. food safety system constructs the role of workers in the process of ensuring safe food. The description of federal food safety regulations reveals the foundation of our worker-related food safety net, and may help to clarify where and how it may be re-woven to capture risks associated with poor working conditions. This increased awareness supports future food safety research and interventions that may better account for food work in contamination control, such as within hazard analysis plans and determinations of high risk foods. Further, the more that is known about worker and worker advocate perceptions of the working condition and food safety relationship, the more effectively we may develop a role for public health to intervene and improve the issue.

1.5 Dissertation Overview

This dissertation is comprised of seven chapters. Chapter 2 presents an overview of the literature and the theoretical foundations that informed the dissertation research. It also includes the dissertation's overarching conceptual framework. Chapter 3 outlines the

methodological approach of the dissertation, including an overview of the case selection, data collection, and analysis procedures used to inform the three manuscripts. The chapter also details human subjects issues and study quality assurance strategies. Chapter 4 presents the first manuscript, titled *An Investigation of the Legally-Constructed Role of Food Workers in U.S. Food Safety*. This research examines the construction of food workers in food contamination and safety as defined by FDA proposed regulations to implement the 2011 Food Safety Modernization Act (FSMA). Chapter 5 presents the second manuscript, titled *Listening to Food Workers: Factors that Impact Proper Health and Hygiene Practice in Food Service*. This manuscript prioritizes the food safety perceptions and experiences of food service workers in Baltimore, Maryland, to help identify the range of factors that may impact proper health and hygiene behaviors. Chapter 6 presents the third manuscript, titled *Poor Food Working Conditions as an Issue of Food Safety: Key Stakeholder Perceptions*. This manuscript describes key stakeholder (worker advocate centers, unions, and related organizations) engagement with a food safety perspective and participant perspectives about the opportunities and challenges for advancing poor working conditions as an issue of food safety on the public policy agenda. Chapter 7 concludes the dissertation by integrating key findings across the three manuscripts, describing the study's limitations and strengths, and identifying implications for future research.

CHAPTER 2. BACKGROUND

2.1 The Global Food System and Infectious Disease

Protecting the U.S. food supply requires understanding the pathways by which contaminants enter the food system, or the organizational structures, processes, resources, and people involved in the growing, harvesting, processing, packaging, distribution, marketing, consumption, and disposal of food (Behraves, Williams, & Tauxe, 2012; Tansey & Worsley, 1995). This system is shaped both by the natural environment, such as soil and water, and by social, political, and economic pressures. Since the late 20th century, increased migration, international travel, and trade in food and other commodities have created greater social, political, and economic interdependence at a global level (Krause, Motarjemi, & Bettcher, 1997; Krause & Hendrick, 2011). As a result, the industrial food system has become global in nature, and increased consolidation has resulted in large processing facilities that efficiently produce and distribute products across the world (Tansey & Worsley, 1995; Woteki & Kineman, 2003). Representing 13% of the U.S. Gross Domestic Product, the food sector sells \$1.8 trillion dollars in goods and services each year. Thus, this food system contributes significantly to the U.S. economy and provides consumers with a wide array of fresh foods year-round and at relatively low cost (Taylor, 2011).

In addition to benefits in terms of costs and availability of foods, industrial food production and greater interconnectedness allow for the rapid spread of infectious disease and food contamination (Cork & Checkley, 2011). Greater access to foreign foods has changed U.S. food preparation techniques and regional preferences, increasing the chance that new and infrequent pathogens enter the system. Under the industrial food model, the

overuse of pesticides and antibiotics has led to multi-drug resistant organisms that infect food, increased pathogen virulence, and reduced antibiotic effectiveness (Travers & Barza, 2002; Woteki & Kineman, 2003). Though the number of foodborne outbreaks has remained steady for decades, pathogens have become increasingly lethal and old pathogens have adapted to new food territories, such as salmonella in nuts (Centers for Disease Control and Prevention, 2011d; Taylor, 2011). When food safety problems do occur, complex production technology and supply chains make it difficult to identify and stop the contamination source. As the U.S. population continues to grow, age, urbanize, and increasingly rely on commercially-prepared foods, the ability of the U.S. food safety system to develop practices that ensure safe food is vital for protecting public health (Cork & Checkley, 2011).

2.2 Foodborne Disease in the United States

2.2.1 The Public Health Burden

As a result of food safety challenges, foodborne disease represents a significant public health problem in the United States. Every year, approximately 48 million Americans become sick, 128,000 are hospitalized, and 3,000 die from contaminated foods (Centers for Disease Control and Prevention, 2011d). Foodborne diseases result from the consumption of foods and beverages contaminated with viruses, bacteria, parasites, toxins, metals, and prions (McCabe-Sellers & Beattie, 2004). While the majority of foodborne diseases result in acute, self-limiting episodes of gastrointestinal problems and vomiting, 2-3% of cases become severe with long-term health consequences, including hemorrhagic colitis, bloodstream infection, meningitis, joint infection, kidney failure, paralysis, and miscarriage (Centers for Disease Control and

Prevention, 2011d). While rare, death from foodborne disease is more likely to occur in infants and children, pregnant women, the elderly, and patients with compromised immune systems (McCabe-Sellers & Beattie, 2004).

The costs associated with foodborne disease are significant. For the individual and household, these may include medical costs, income or productivity loss, and pain and suffering. Contaminated food affects the food industry through product recalls, plant closings, and reduced product demand. To both address and prevent foodborne illness, the public health sector incurs costs from implementing and running disease surveillance systems, education, and outbreak investigation (Woteki & Kineman, 2003). Recent studies estimate that health costs from foodborne illness total U.S. \$77.8 billion per year, or average to approximately \$1,626 per illness episode (Scharff, 2012).

2.2.2 Foodborne Outbreaks, Trends, and Risk Factors

Cases of foodborne disease are classified as outbreaks when two or more persons experience a similar illness after consuming a similar food or beverage (Centers for Disease Control and Prevention, 2013). Currently, the Centers for Disease Control and Prevention (CDC) collects information on foodborne outbreaks from all states, the District of Columbia, and Puerto Rico. These data include information on the number of sick persons, hospitalizations, deaths, the agent or pathogen, implicated food, and other factors related to food preparation and consumption (Centers for Disease Control and Prevention, 2013). Each year, approximately 1,000 outbreaks are reported to the CDC, though the true occurrence is unknown and likely higher. This reporting gap results from challenges in outbreak identification, which relies on sick individuals to seek treatment, medical testing and determination of the food and agent, and health department

investigation and reporting (Painter et al., 2013; Scallan et al., 2011; Woteki & Kineman, 2003).

Over the last 15 years, progress in addressing foodborne illness and outbreaks has remained relatively stagnant (Centers for Disease Control and Prevention, 2011d). An inherent challenge of controlling contamination is the fact that food-contaminating microorganisms are everywhere – in the air, soil, and water, as well as on the surface of plants and animals, and in the mouth, nose, and intestines of animals and humans (Adams & Motarjemi, 1999). As such, common sources of foodborne pathogens include flies, polluted water, domestic and wild animals, human and animal waste, food workers, and dirty equipment, which may then infect food through failure to detect and remove diseased materials, inadequate food storage, handling, and/or processing, poor health and hygiene, and intentional introduction into the food supply (Adams & Motarjemi, 1999; Merrill & Francer, 2011). These factors are further complicated by industrial food animal production systems, where public health threats such as antibiotic-resistant pathogens and contaminated animal waste in groundwater are found to originate and to create opportunities for food contamination (Solomon, Yaron, & Matthews, 2002) .

Across the variety of sources of foodborne outbreaks and disease, one of the most common is identified as food workers through poor health, hygiene, and improper food handling practices (Centers for Disease Control and Prevention, 2011d; Gould et al., 2013; Todd, Greig, Bartleson, & Michaels, 2008). Further, norovirus, the pathogenic cause of most foodborne illness in the U.S., has been most commonly linked to foods prepared by workers in commercial settings, such as delis and restaurants (Hall et al., 2012; Hall et al., 2013) . According to Greig et al. (2007), food workers across food work

settings have, for decades, been identified as the source of many foodborne outbreaks, with few indications that this trend is on the decline. In this way, a key factor for improving food safety resides in the extent to which our food safety system understands and manages the relationship between food work and food risk.

2.3 Food Work, Working Conditions, and the Impacts on Health in the United States

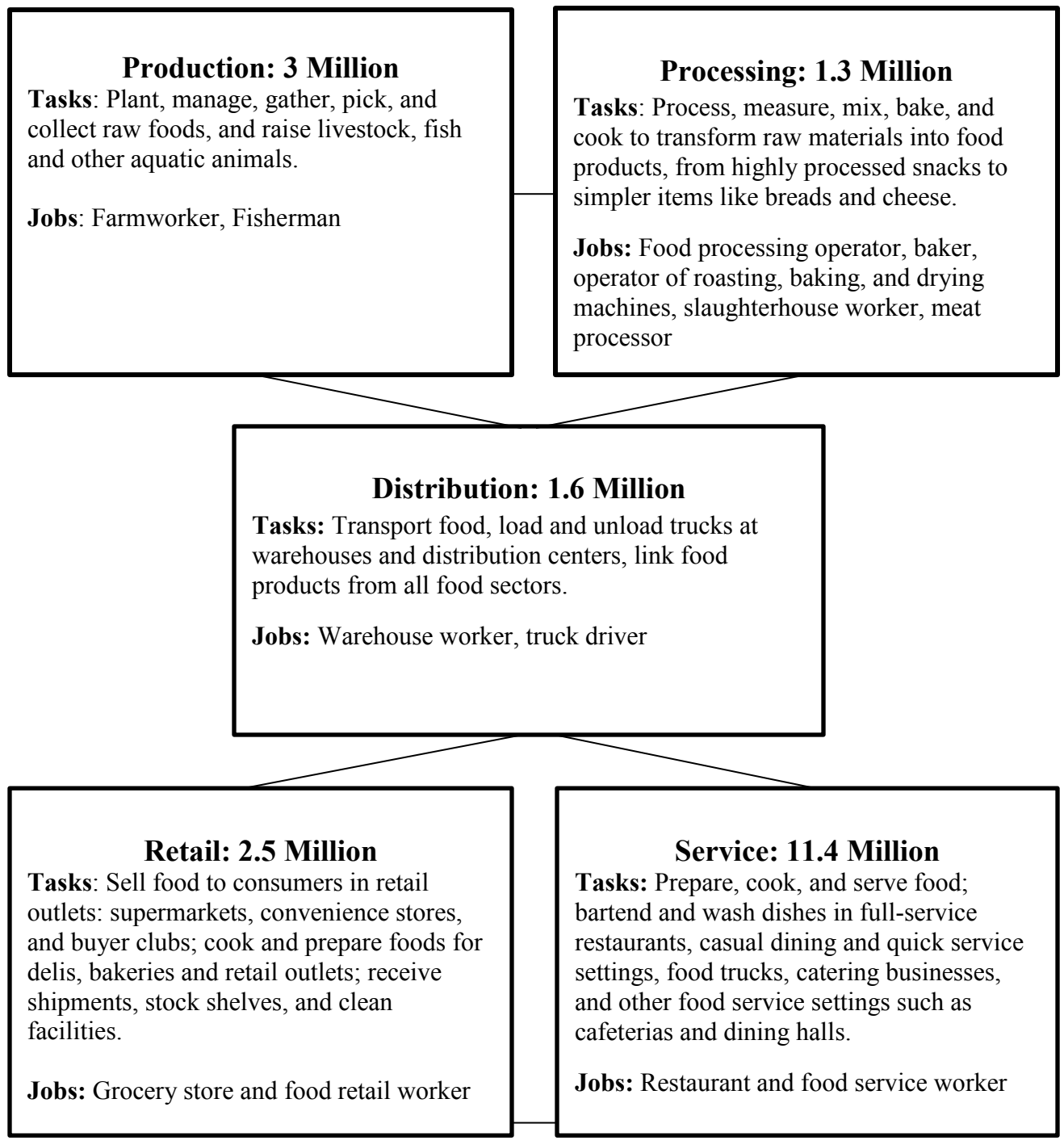
2.3.1 Jobs in the Food Chain

Approximately 20 million people (1/6th of the U.S. workforce) work in five key sectors of the food system, which include food production, processing, distribution, retail, and service (Food Chain Workers Alliance, 2012). In order to appreciate the connection between workers and food safety, it is important to understand the types of jobs and populations that make up our food system.

Since food service represents over half of food workers, the average food worker is a non-Hispanic white, U.S.-born person whose primary language is English and who holds a high school degree or less. Approximately half of food workers are female and two-thirds are 44-years-old or younger. Food system jobs may include positions as management, supervisor, professional, and/or office worker, though 86% of all workers are categorized as front-line staff, or hold jobs with repetitive work and little decision-making capacity. While most workers have lived in the U.S. for their entire lives, approximately 23% were born elsewhere (Food Chain Workers Alliance, 2012). Finally, since most food jobs do not require formal credentials, the food system provides work opportunities to undocumented workers and government labor data likely underestimate the prevalence of this population. Food sector size, tasks, and jobs are summarized in **Figure 1** [located on the next page].

Figure 1. Worker Tasks & Jobs across 5 Key Food Sectors

(Food Chain Workers Alliance, 2012; U.S. Department of Labor, 2014b, 2014c, 2014d)



Food Production

There are 3 million people who work in food production, which represents 15% of the food system workforce (Food Chain Workers Alliance, 2012). Food production workers include farmworkers who raise livestock and plant, manage, gather, pick, and collect raw foods, and fisherman, who raise, catch, sort, and pack fish and other aquatic animals (Food Chain Workers Alliance, 2012; U.S. Department of Labor, 2014b).

For a variety of reasons, it is difficult to determine the size of the farmworker population; however, estimates range from 1 to 3 million workers (Economic Research Service, 2012; National Center for Farmworker Health, 2012). Farmworkers mostly work outdoors as field crop workers, nursery workers, and livestock workers; approximately half are employed in California, Florida, Texas, Washington, Oregon, and North Carolina. Compared to other U.S. workers, farmworkers are younger, less educated, more likely to be foreign-born and male, and less likely to speak English, be a U.S. citizen, or hold a legal work permit (Economic Research Service, 2012). An estimated 82% self-identify as Hispanic, with the majority born in Mexico. There are no formal requirements to become a farmworker, and between 53% and 60% are estimated to be undocumented immigrants (Carroll, Samardick R., Bernard S., Gabbard S., & Hernandez T., 2005; The Southern Poverty Law Center, 2010). There are approximately 36,000 fisherman or fish farmers in the United States, and this industry experiences high turnover due to the seasonal nature of the job and lack of a steady income. Fishing is characterized as strenuous and hazardous, depending on the body of water and type of fish sought (U.S. Department of Labor, 2014b). No formal education is required to become a fisherman and workers usually learn on the job (U.S. Department of Labor, 2014b).

Food Processing

There are 1.3 million people who work in food processing, which represents 7% of the food system workforce (Food Chain Workers Alliance, 2012). Processors include bakers and food processing operators who measure, cook, mix, bake, and assemble raw ingredients into finished products and monitor food temperatures. They also include slaughterhouse workers (packers and eviscerators) who slaughter, clean, and divide animal carcasses, as well as butchers, boners, and trimmers who often repeat the same cut to one type of meat product for the duration of their shift. Some production workers act as operators and tenders of baking, roasting, and drying machinery, and process meat as well as foods like tortillas, fruits (e.g., raisins), and vegetables (U.S. Department of Labor, 2014c). Many of the food products created in the processing sector are shipped in bulk to food warehouses, retail outlets like grocery stores, and service outlets like restaurants. Food processing workers often inspect and pack final products and sterilize and clean the processing area (The Johns Hopkins Center for a Livable Future, 2012).

An estimated 500,000 people work in U.S. slaughterhouses and meat processing facilities (Kandel, 2009). These workers are predominantly African American and Latino, 38% are foreign-born, and many live in low-income communities (U.S. Government Accountability Office, 2005). These facilities experience high turnover, and it is believed that many employers knowingly hire undocumented workers, estimated to represent 25% of the workforce (Human Rights Watch, 2005; Passel & Cohn, 2009; U.S. Government Accountability Office, 2005). Many slaughterhouse positions are at-will, which means jobs may be terminated at any time without advance warning.

Bakers most often work in commercial settings, such as large factories (18%), or retail environments, such as bakeries and tortilla factories (31%), grocery stores (27%), limited-service eating places (12%), and restaurants (4%) (U.S. Department of Labor, 2014c). While some bakers attend culinary school or an apprenticeship program, most receive long-term on-the-job training.

Next, approximately 131,000 individuals work as food processing operators (U.S. Department of Labor, 2014c). These workers use a large assortment of equipment to create highly processed foods like breakfast cereals, frozen pizza, candy, and chips, medium-processed foods like flour, and minimally processed foods like milk. These jobs generally require a high-school diploma or equivalent, and have on-the-job training. Finally, meat, poultry, and fish cutters and drying equipment operators work in food manufacturing plants (U.S. Department of Labor, 2014c). These jobs often require workers to operate dangerous equipment in loud and wet environments that are very hot or cold (The Southern Poverty Law Center, 2010). Across processing jobs, workers perform most or all tasks while standing (U.S. Department of Labor, 2014c).

Food Distribution

Approximately 1.6 million people work in food distribution, which represents 8% of the food system workforce. Distribution workers include warehouse workers who load and unload trucks and move products using equipment and physical labor, sometimes in cold storage environments (Food Chain Workers Alliance, 2012). Limited data are available regarding work and workers in this sector. However, a few reports, including one focused on the greater Chicago area and Southern California, find that workers in these major distribution centers are generally employed through staffing or temp

agencies, such that workers are expected to leave the employer within a certain period of time. These positions often pay at or below minimum wage (Food Chain Workers Alliance, 2012; Smith & McKenna, 2014; Warehouse Workers for Justice, 2010).

Food Retail

There are 2.5 million people who work in food retail, representing 13% of the food system workforce. Food retail workers include grocery store workers such as cashiers, clerks, deli workers, and those who stock shelves and clean facilities (Food Chain Workers Alliance, 2012). Approximately one half of all food retail workers are women, 85% are non-Hispanic white, 10% African American, and 4% Asian. One third of the industry is between the ages of 35 and 54, while teenagers (16-17) represent 11% and workers 65 and over 3% (Lovell, Song, & Shaw, 2002). This sector does not require formal credentials, and approximately 29% of workers did not finish high school. Almost half of all retail positions are part-time (46%) and 52% of the part-time workforce is female (including 7% single mothers), which means that women are most greatly affected by the limited hours and pay in this sector (Lovell et al., 2002).

Food Service

With 11.4 million workers representing 54% of the food system workforce, service is by far the largest food sector (Food Chain Workers Alliance, 2012). Food service workers include bartenders who mix and serve drinks, chefs and head cooks who oversee staff and food preparation, cooks who prepare, season, and cook foods, food preparation workers who work under cooks to slice, peel, chop, cut, mix, and prepare cold foods, food and beverage serving and related workers (who conduct food preparation and cleaning duties in places like cafeterias and hotels), bussers, dishwashers,

and waiters and waitresses who take orders and serve food and beverages to customers (U.S. Department of Labor, 2014d).

The food service sector is mostly comprised of restaurant workers (88%), the vast majority of whom work in non-supervisory positions (90%) (Restaurant Opportunities Centers United, 2010). Across restaurant jobs, half of the workers are women, 22% Latino or Hispanic, 11% African American, and 6% Asian (U.S. Department of Labor, 2014d). In general, the restaurant industry does not require formal training; however, many workers have higher levels of education than workers in other sectors, with 38% of workers over 25 years of age holding a high school degree, 27% with some college, and 15% with a bachelor's degree or higher (Restaurant Opportunities Centers United, 2010). According to the Pew Hispanic Center (2009), undocumented workers comprise 12% of the restaurant workforce.

2.3.2 Food Working Conditions

Although some food sector jobs provide a livable wage and opportunities for upward mobility, the majority offer low wages with little access to benefits, few opportunities for advancement and training, and significant risks to worker health and safety (Food Chain Workers Alliance, 2012). Overall, the 86% of food workers who work in front-line positions also report earning low or poverty wages. This pay includes a median salary of \$18,880 per year and represents the least across all jobs in the food sector as well as across U.S. industries, including healthcare, manufacturing, government, retail trade, construction, education, and transportation. In fact, six of the ten lowest paying jobs in the U.S. are in the food industry, including the bottom three as (3)

dishwasher, (2) food prep cook, and (1) fast food cook (U.S. Department of Labor, 2014e).

Beyond low pay, many food workers cite that the inconsistent provision of wages and work hours challenges their ability to plan and achieve economic stability. For approximately 40% of food workers, making ends meet requires working for two or more employers for 40 hours a week and with little access to breaks (Food Chain Workers Alliance, 2012). For some production workers, wages are earned according to a piece-rate, a payment structure that connects earnings to stamina and output and negatively impacts worker health and safety (Johansson, Rask, & Stenberg, 2010).

Agricultural work is considered one of the most hazardous jobs in the U.S., putting workers at regular risk for heat exhaustion and stroke (Carroll, Samardick R., et al., 2005). Compared to the general public, production workers suffer higher rates of toxic chemical injury and pesticide exposure (Economic Research Service, 2012). Many hired farmworkers live in employer-provided housing, which has been found to be low quality, with crowding and poor sanitation (Economic Research Service, 2012). In a study of cooking facilities within farmworker housing in North Carolina, Quandt and colleagues (2013) identified cockroach infested food preparation areas and contaminated water sources, signaling a lack of employer compliance with housing regulations and risks to worker health. These risks extend to significant sexual harassment problems, where reports from females in food production and service suggest female food workers experience higher rates of sexual harassment than women in the general workforce (Jayaraman, 2012; The Southern Poverty Law Center, 2010; Waugh, 2010).

These conditions are exacerbated by the fact that 79% of workers report that they lack, or do not know if they have access to paid sick days, 83% report a lack of health insurance from employers, and 58% lack any coverage whatsoever. These conditions make it difficult for workers to care for themselves or their families and many report that they rely on the emergency room for primary care. Further, more than half report working while sick (Food Chain Workers Alliance, 2012). To complicate the issue, some workers note that the nature of work environments prolongs illnesses, sometimes for months (Food Chain Workers Alliance, 2012). For example, most production jobs require working outdoors, meat processors work on slaughtering floors that lack climate control and trap heat in summer and cold in the winter, and food processing, distribution, retail and service workers operate in extreme temperatures to help preserve foods (U.S. Department of Labor, 2014b, 2014c, 2014d). Finally, more than half of workers report that they handle food without health and safety training and a third report a lack of access to proper equipment to do their job (Food Chain Workers Alliance, 2012).

Some poor working conditions are, in part, related to food worker exemptions under U.S. Department of Labor laws such the Fair Labor Standards Act (FLSA) and the National Labor Relations Act (NLRA) (Farmworker Justice and Oxfam America, 2010; Liu, 2012). The FLSA entitles some workers to the minimum wage for each hour worked (\$7.25), overtime pay of one and one-half times the regular rate for each hour worked over forty-hours per week, and that employers maintain payroll records. Under the NLRA, workers earn protection for union organizing and collective bargaining (U.S. Department of Labor, 2004b, 2013). Currently, farmworkers are exempt from the NLRA and the FLSA overtime pay requirements, and workers on small farms (fewer than 7

workers employed in a calendar quarter) are excluded from all protections (Farmworker Justice and Oxfam America, 2010). Further, employers of workers classified as tipped employees (those who customarily and regularly receive more than \$30 a month in tips) are only required to pay \$2.13 per hour, as long as that amount combined with worker earned tips equals the federal minimum wage (U.S. Department of Labor, n.d.)

In an effort to make up for lack of farmworker protection under the FLSA, Congress passed the 1982 Migrant and Seasonal Agricultural Worker Protection Act. This Act regulates farm contracts such that employers must disclose wage rates and job terms to workers, keep detailed records of wages and hours worked, meet local and federal housing and safety health standards, and register with the Department of Labor (Farmworker Justice and Oxfam America, 2010). Despite these added protections, employment law violations, such as not being paid for full hours worked and poor work and housing conditions persist among workers in the food chain (Food Chain Workers Alliance, 2012).

2.3.3 The Impacts of Food Work on Family Health

Beyond the workplace, poor food working conditions impact workers' families. It is sadly ironic that food workers and their families experience high rates of food insecurity, or the lack of access to enough food for an active and healthy life (Economic Research Service, 2013; Restaurant Opportunities Center of New York, 2014). To support themselves, food workers often participate in public assistance programs, such as the Supplemental Nutrition Assistance Program (formerly known as Food Stamps), at twice the rate of all other workers in the U.S. (Food Chain Workers Alliance, 2012).

Further, the conditions faced by the majority of U.S. food workers exact a price on their children. The lack of access to health benefits and an inability to stay home with sick children has been associated with children experiencing worse health and slower recovery times (Heymann, 2003). Poor working conditions also impact children's educational attainment and risk for injury, as children spend more time alone, lack stimulation necessary for physical and cognitive growth, and regulate themselves or are regulated by other children (Heymann, 2003). While these scenarios impact many working families, they particularly disadvantage the poor, who often lack access to support that may help with inflexible schedules, such as affordable and quality child care (Heymann, 2003). These conditions also impact elderly and disabled family members who often have caregiving needs that require attention from working adults. As the U.S. elderly population grows to 379 million by 2050, the inability of food workers to effectively care for this population represents a serious public health problem (Heymann, 2003).

2.4 Implications of Working Conditions for Food Risk

The negative health impacts of poor working conditions and the states of deprivation that they create—inadequate food, housing, and sanitation—have been recognized for centuries (Braveman, Egerter, & Williams, 2011). A smaller body of research, however, has extended this knowledge base to consider which poor food working conditions may impact worker health in ways that directly impact food safety, such as working while ill (Braveman et al., 2011; Johns, 2010).

2.4.1 Presenteeism

Presenteeism is a term that describes working when ill (Johns, 2010) . Since the 1980s, this workplace problem has been studied in business and social science literatures, and examined mostly for impacts of chronic conditions, like arthritis, on worker productivity, measured as economic costs (Johns, 2010; Schultz & Edington, 2007). The existing research that applies this problem to public health has focused mostly on health care settings, or risk of workers spreading infectious disease to vulnerable patient populations (Rodriguez, Parrott, Rolka, Monroe, & Dwyer, 1996; Widera, Chang, & Chen, 2010). This body of research is valuable for understanding the impact of food working conditions on presenteeism in food jobs, particularly as food, like patients in health care settings, extends the risk of presenteeism beyond productivity to issues of food safety and public health (Widera et al., 2010).

Factors Driving Presenteeism

Research suggests that presenteeism is related to both personal and work factors, including work discipline, employee status in the work hierarchy, and human resource policies such as pay, paid sick days, attendance control, downsizing, and permanency of employment (Johns, 2010, 2011). For example, in a systematic review of presenteeism research, Johns (2011) found that employees who perceived themselves as replaceable, held temporary status, and lacked a sense of job security exhibited more presenteeism days. In a study of infectious disease outbreaks in New York State nursing homes, Li and colleagues (1996) found that homes with paid sick leave policies were less likely to have infectious disease outbreaks, attributing the relationship to reduced presenteeism. To the author's knowledge, no similar studies have been conducted for the food worker

population. However, these data corroborate findings from surveys conducted with food workers who often reported working while sick (53%) and attributed their behavior to a lack of paid sick days, a belief that one would otherwise lose her job, and threats made by an employer (Food Chain Workers Alliance, 2012).

Consequences of Presenteeism

Presenteeism is associated with lost productivity as workers are paid a salary but cannot perform at optimal levels, increased chance for worker injury or mistakes, and a further drop in productivity and increased risk for injury and mistakes as the sickness of one worker spreads to others (Collins et al., 2005; Widera et al., 2010). For food workers, presenteeism likely holds implications for disease transmission (to other workers and food) as well as for the successful performance of measured tasks such as the ability to control food temperatures and operate machinery properly, watch the flow of products, and check products to ensure accuracy and absence of adulteration or health problems (Nestle, 2010). Ultimately, though research examining drivers of presenteeism is limited, existing data suggest the importance of considering food working conditions in efforts to control and prevent worker-related food safety risks (Johns, 2011).

Considering previous descriptions of food workers, however, it is clear that the food industry *runs* on work characterized by factors that may increase presenteeism as well as other risks for food. This state of affairs suggests working conditions may not be considered in food safety strategies, which is problematic for reducing the burden of foodborne disease as well as for workers who are expected to keep food safe despite conditions that impact their own well-being and make them a risk for food. In order to understand how to address this problem, it is essential to identify where we now stand, or

how the role of food workers is accounted for in food safety. In the next section, the historical origins and current structure of the U.S. food safety system is presented to provide context and to help define the key stakeholders and policies that may be most appropriate for answering this question.

2.5 Historical Origins of The Federal Food Safety System

The connection between poor food working conditions and food production risk was first documented in Upton Sinclair's 1906 novel *The Jungle*. Through detailed accounts of the lives of immigrant workers in Chicago Stockyards and meatpacking companies, Sinclair wrote of an inseparable link between unsanitary food production and work that included wage-theft, high-risk activity, low pay, and the absence of social benefits. The novel was well-received by the public, though to Sinclair's dismay, outcry focused on filthy meat and overlooked workers (Young, 1989). According to social historian James Harvey Young (1989), these events ended three decades of Congressional debate regarding regulation of the U.S. food supply as President Theodore Roosevelt, angered by the novel, signed the 1906 Pure Food and Drug Act (PFDA) and Meat Inspection Act (MIA) into law. This legislation marked the beginning of federal regulation of food and drugs in the United States, and added the assurance of a safe, wholesome, and sanitary food supply to the tasks of the U.S. Food and Drug Administration (FDA), then located in the U.S. Department of Agriculture (USDA) (Johnson, 2014; U.S. Food and Drug Administration, 2009; Young, 1989) .

The FDA Pure Food and Drug Act focused food safety regulation on preventing manufacture, sale, or transportation of adulterated, misbranded, poisonous, or toxic foods intended for interstate commerce. Food specimens could be examined for adulteration by

the Secretary of Agriculture, with violations leading to removal and destruction of products at the manufacturer's expense (Merrill & Francer, 2011). The Meat Inspection Act, under the jurisdiction of the USDA Food Safety and Inspection Service (FSIS), focused on facility cleanliness and food labeling requirements, federal inspection programs, pre- and post-slaughter screening of cattle, hogs, sheep, goats, and equines intended for interstate commerce, and procedures for monitoring meat slaughter and processing (U.S. Food and Drug Administration, 2009; Young, 1989). Thirty years later, Congress would pass the 1938 Federal Food, Drug, and Cosmetic Act, which added FDA authority to inspect food factories, create food identity and quality standards, and required food companies to label ingredients on food products (Merrill & Francer, 2011).

2.6 The Current Federal Food Safety System

2.6.1 The Regulatory Framework

Since the 1940s, the U.S. food safety system has grown increasingly complex and fragmented (Merrill & Francer, 2011; Woteki & Kineman, 2003). There are currently 15 federal agencies that work with state and local governments to carry out 30 food safety laws (Johnson, 2014). These federal agencies include The U.S. Food and Drug Administration (FDA), The U.S. Department of Agriculture (USDA), The Environmental Protection Agency (EPA), and The Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention, 2011a). The food safety authority of each agency is separated either by product type (e.g., meat vs. non-meat) and/or regulatory function (e.g., setting safe pesticide levels vs. inspecting them).

The Food and Drug Administration (FDA) & the U.S. Department of Agriculture (USDA)

The FDA and the USDA are identified as the main federal actors in protecting food as they receive the majority of food safety funding and employ the majority of food safety-related staff (Johnson, 2014). The FDA conducts food safety responsibilities with the help of its Center for Food Safety and Applied Nutrition (CFSAN), field personnel, and laboratories (Merrill & Francer, 2011). The tasks of these stakeholders include monitoring the safety, wholesomeness, and accurate labeling of foods and products not otherwise covered by the USDA. These products include produce, seafood, fresh eggs, dairy, some meats, and processed foods (Johnson, 2014). To help ensure safe food, the FDA can remove and destroy adulterated food from the market through mandatory recalls (U.S. Food and Drug Administration, 2014a; Woteki & Kineman, 2003).

The primary law governing how the FDA ensures food safety is the 2011 Food Safety Modernization Act (FSMA), which amends the 1938 Food Safety, Drug, and Cosmetic Act. The FDA's total budget is around \$1 billion and includes approximately 9,000 staff (Merrill & Francer, 2011). Its foods program budget was \$882.7 million in FY2012, and included regulatory support of eight other federal agencies (to conduct surveillance, education, set standards, and conduct outbreak response activities) (Johnson, 2014; Woteki & Kineman, 2003). The agency is expected to inspect around 76,000 domestic food manufacturers and warehouses on a periodic basis – or once every few years, which by 2008 included 15,000 annual inspections (Johnson, 2012, 2014). Ultimately, the FDA is responsible for 80%-90% of the food supply, and receives slightly less than half of the total U.S. food safety budget (Johnson, 2014).

The USDA conducts most of its food safety work through the Food Safety and Inspection Service (FSIS). The FSIS ensures that domestic and imported meat and poultry are safe, wholesome, and properly labeled (Johnson, 2014; U.S. Food and Drug Administration, 2013a). These responsibilities are carried out through continuous inspection and product label approval (Merrill & Francer, 2011). The agency's food safety activities are mainly governed by the 1906 Meat Inspection Act (MIA), the 1957 Poultry Products Inspection Act (PPIA), and sections of the 1970 Egg Products Inspection Act (EPIA). Under the MIA, inspectors conduct continuous inspection, or examination of every animal carcass that passes through a slaughterhouse. The goal is quick detection and removal of any food product that may exhibit food safety or sanitation problems (Woteki & Kineman, 2003). The USDA's FY2012 total budgetary resources were \$225 billion with around 100,000 staff (U.S. Department of Agriculture, 2013a, 2013b). Its FSIS-specific budget was around \$1 billion, which includes 8,000 inspectors in 6,300 meat, poultry, and egg product plants (Johnson, 2014; U.S. Department of Agriculture, 2013b).

Other Players: The Centers for Disease Control and Prevention (CDC) & the Environmental Protection Agency (EPA)

The main food safety role of the CDC is to connect the food safety work of the FDA, USDA, and the food industry to human illness (CDC, 2011). The CDC investigates, monitors, and identifies foodborne outbreaks, describes the public health burden of foodborne illness, and conducts epidemiological investigations to connect outbreaks to specific agents, foods, and settings (Centers for Disease Control and Prevention, 2011a; Merrill & Francer, 2011). The organization's main tracking program is called FoodNet, which is an active surveillance system that collects data on the

incidence of foodborne disease and is informally labeled America's report card for food safety (Centers for Disease Control and Prevention, 2011a). The Environmental Protection Agency (EPA) is responsible for ensuring that the public and the environment are protected from the dangers of pesticides used on food crops, as well as for investigation and promoting safer methods for managing pests (Johnson, 2014; Woteki & Kineman, 2003). To achieve this goal, the agency licenses pesticides for use on farms, determines tolerance levels on food, and manages a pesticide registration system (Merrill & Francer, 2011).

2.7 Food Safety Regulation under the FDA

Since 1969, groups such as the National Research Council, the Food Marketing Institute, and the Government Accountability Office have pushed to reorganize the food safety system into a single federal agency (Nestle, 2010). Congress, however, has ignored the advice, and government agencies have worked to protect their food safety roles and resources. As an alternative approach, Congress recently supported the FDA's adoption of a prevention-based farm-to-table strategy for food safety. In short, this plan aims to reposition the U.S. food safety system to better prevent, rather than react to contamination. The details of this plan, including controls and best practices defining the role of food workers, are located within the FDA regulations that implement the 2011 Food Safety Modernization Act (FSMA) and the 2010 Retail Food Safety Initiative (RFSI) (Nestle, 2010).

2.7.1 The Food Safety Modernization Act (FSMA)

The 2011 Food Safety Modernization Act (FSMA) represents the largest overhaul of food safety laws in over 70 years (U.S. Food and Drug Administration, 2014a). This law does not apply to all food sectors and only regulates food facilities that are required to register with the FDA: production, processing, and distribution sectors (not retail or service). Therefore, the FSMA requires development of regulations regarding how workers in these sectors must engage with food to keep it safe. As such, it also describes how the food safety system accounts for production, processing, and distribution workers, and their working conditions, as relevant to safe and sanitary food.

To describe these best practices, the legislation outlines five mandates for building a new food safety system in the U.S. The mandates aim to control food risk by focusing on issues of prevention, inspection and compliance, response, and imports, as well as responsibilities for building formal systems of collaboration with other government agencies (U.S. Food and Drug Administration, 2014a). Among these tasks, the prevention mandate requires that regulations describe requirements for reducing or preventing risks associated with workers, including issues related to food handling, worker hygiene and cleanliness, and training (U.S. Food and Drug Administration, 2014a).

2.7.2 The Retail Food Safety Initiative (RFSI) & The FDA Food Code

A second piece of the FDA's prevention-based strategy is the Retail Food Safety Initiative, which applies to retail and service sectors, or the food sectors not covered by the FSMA (U.S. Food and Drug Administration, 2011b). This initiative aims to control food safety risk related to food from unsafe sources, poor hygiene, inadequate cooking,

improper food holding, and contaminated surfaces and equipment. Given the large size of the food retail and service sectors, their regulation is primarily conducted at the state level, with the FDA providing guidance to develop and update food safety rules and to strive for consistency with national food regulatory policy (U.S. Food and Drug Administration, 2011b, 2014b) .

Along this vein, the contents of the initiative revolve around increasing service and retail establishment's adoption of the FDA Food Code. The Food Code is a reference document for state and local agencies to use in designing food retail and service sector regulations. This document outlines best practices for food handling, preparation, and storage, and covers food safety controls for workers (U.S. Food and Drug Administration, 2005). Adoption of the Food Code is not required, but strongly encouraged by the FDA and, as of 2013, all 50 states use it for their food safety regulations (U.S. Food and Drug Administration, 2013d). Like the FSMA, the Food Code textually represents a legal construction of the role of food retail and service workers in ensuring safe food.

2.8 Summary and Dissertation Overview

2.8.1 Conceptual Framework

The following conceptual framework (**Figure 2**) shows the chain of factors influencing food safety specifically related to food workers. As detailed in the introduction, extant literature describes *macro-level structures* that influence food working conditions (e.g., labor relations laws), as well as the poor state of *food working conditions* generally (section 1.3.2). Next, literature from business and health care fields explores the association between inadequate working conditions (e.g., lack of paid sick days) and certain *worker-related hazards* for food (e.g., working while sick) (sub-section

1.4.1). Finally, food protection research has described the link between such hazards (e.g., infected workers) and risks to *food safety* (e.g., contamination) (sub-section 1.2.2).

Ultimately, these bodies of research reveal an important question: if working conditions can make a worker a risk to food, then why does our food system operate under the worst working conditions in the country? And, how might we better support the maintenance of public health, through food safety, by accounting for conditions of poverty wages, lack of access to benefits, labor violations, and high risks to injury and health in the definition of safe food? To address these questions, the primary aim of this dissertation is to understand *how* our food safety system takes account of the role of workers in food safety strategies. Exploring this phenomenon requires understanding worker-related food safety strategies (*worker food safety controls and hazards*) as outlined by the U.S. food safety system as well as exploring the construction of these issues through food worker and food worker advocate perceptions. (See **Table 1** on the next page for definitions of key study concepts.)

Figure 2. Conceptual Framework - The Role of Food Workers in Food Safety

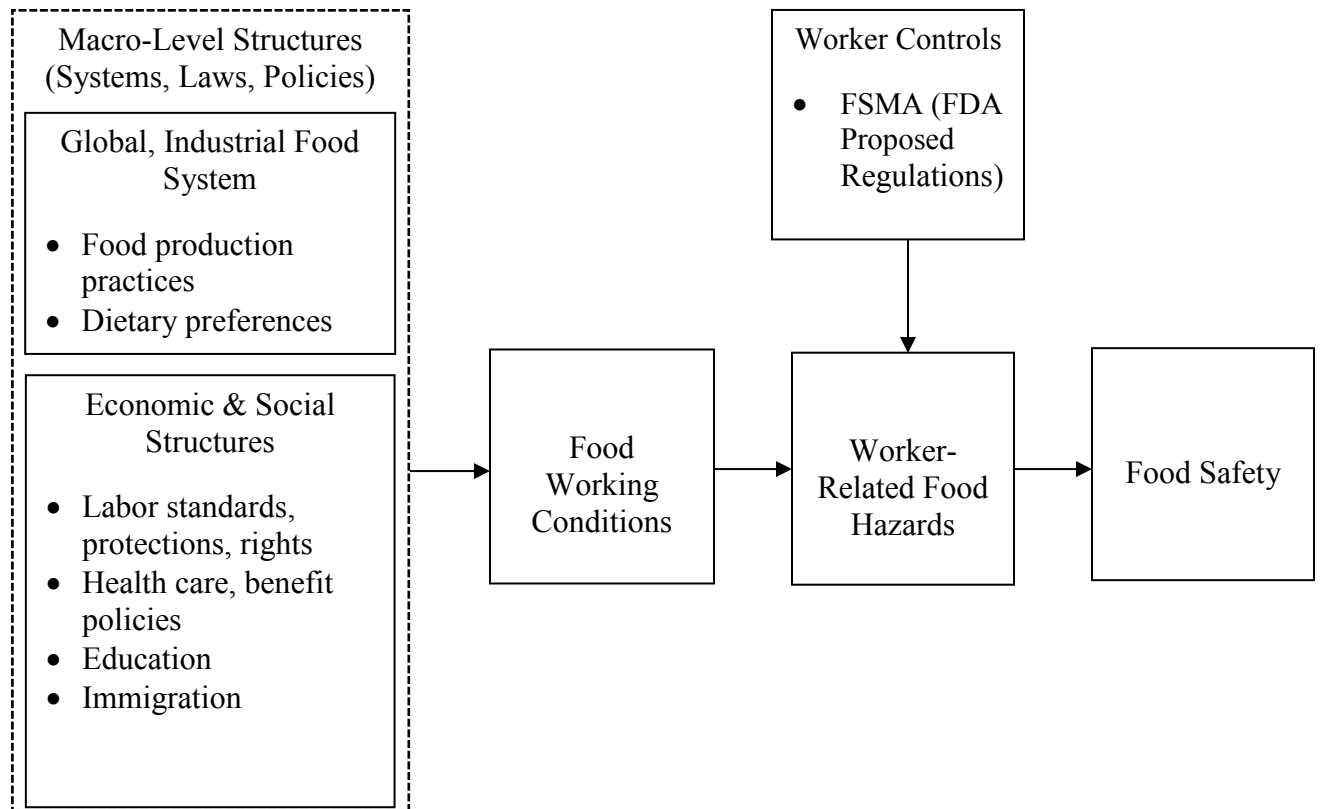


Table 1. Defining Conceptual Model Concepts	
<i>Concept</i>	<i>Definition</i>
Macro-Level Structures	Broad social/economic/political structures that influence food work.
Food Working Conditions	The [food production, processing, distribution, retail, and service] work environment and all existing circumstances affecting labor in the workplace, including job hours, physical aspects, legal rights and responsibilities ("Working Condition," 2014).
Worker-Related Food Hazards	Factors related to food workers that may cause significant biological (e.g., pathogens), chemical (e.g., cleaning agents), or physical hazards (e.g., hair, dust) in food (FDA, 2012).
Worker Controls	Activities or interventions that aim to control or prevent worker-related contamination in food ("Contamination Control," 2014). In this research, worker controls are described in FDA proposed regulations to implement the FSMA ("Regulation," 2014).
Food Safety	The handling, preparation, and storage of food to prevent foodborne illness (Satin, 2008).

2.8.2 Theoretical Foundations

This research seeks to explore how food safety interventions, such as those outlined in FDA proposed rules implementing the FSMA, control food contamination related to workers—including consideration for the impact of food work on workers and food safety risk. Social Conditions as Fundamental Causes of Disease Theory as well as the Social Ecological Model represent useful frameworks supporting the importance of this investigation, and guiding its development. Specifically, each theory emphasizes how we construct a problem and that the point at which we choose to intervene may be more or less effective depending on the extent to which contextual factors are also considered, such as the influence of poor food working conditions on worker health, hygiene behavior, and food safety.

Fundamental Causes Theory & the Social Ecological Model

Fundamental Causes Theory was first outlined by Link and Phelan in 1995. Describing social conditions as fundamental causes of health and disease, the theory sought to explain why the association between socioeconomic position and health disparities persisted, despite reductions in diseases and conditions previously implicated as sources of morbidity and mortality in these populations (Phelan, Link, & Tehranifar, 2010). The theory claims that the association remains due to the fact that socioeconomic position avails the individual to critical resources—prestige, money, knowledge, power, and beneficial social connections—that protect health, no matter what the prevailing and intervening mechanism at the time (Link & Phelan, 1995). As such, an enduring influence on health requires consideration for and attention to the social conditions that represent the fundamental causes of health and disease.

Social Ecological Models, rooted in the Ecological Framework for Human Development outlined by Bronfenbrenner in the 1970s, seek to inform health research by emphasizing that the individual and her social environment impact each other, and that behavior cannot be fully understood without consideration of the context in which it occurs (Sallis, Owen, & Fisher, 2008). As the next section will describe, these theories emphasize broadening current worker-related food safety strategies from attempting to understand health and behavior almost exclusively at the individual-level and within the confines of the food facility to how they may also be shaped by the social and structural environment, such as poor food working conditions.

Application of Frameworks to Food Work and Food Safety

Social Conditions as Fundamental Causes of Disease Theory asserts that society's social, political, and economic relationships affect people's ecological context and how they live, and thus shape patterns of disease distribution. Under this framework, factors like education and class are considered to differentially impact working conditions as well as physical, psychological, and environmental exposures, which result in varied impacts and patterns of disease (Krieger, 2008). This framework highlights the importance of macro-level factors that shape food working conditions, which in turn shape worker health and hygiene behaviors, which impact food safety. As such, this theory emphasizes that food safety interventions tied to workers must consider this population in light of their socioeconomic position, such that this position and the resources it affords influence the extent to which workers may be able to exhibit the health and hygiene behaviors demanded by the food safety system. This theoretical focus contrasts slightly from the guidance provided by the Social Ecological Model, which

emphasizes explicit consideration for multiple levels of influence on worker health behaviors, which includes the broader social and economic environment as well as the intra and interpersonal levels (Sallis et al., 2008).

From a food safety perspective, both frameworks are useful for examining the relationship between food work and food risk. This dual usefulness results from the fact that food workers may pose risk to food through their food handling and hygiene behaviors (e.g., proper food storage; hand washing; glove use), health behavior (e.g., working sick) *and* health (e.g., illness, infection). The Social Ecological Model underscores the point that food-safety related behavior is influenced by intrapersonal factors as well as other levels of the social environment, including interpersonal, institutional, community, and policy (Sallis et al., 2008).

Fundamental Causes Theory complements this perspective by contextualizing this research in the reality that food workers represent a deeply disadvantaged group that lacks access to resources by which they may protect their health (Link & Phelan, 1995). As such, the theory argues that any intervention or effort to understand worker health and behavior must consider the fundamental health influence of political and work-related institutions and the differential work and life experiences they create. From a food safety perspective, this theoretical guidance supports connecting the role of workers in food safety to food working conditions as well as the macro-level context that shapes them.

Overall, the central application of each framework is that understanding health and health behaviors, particularly among vulnerable groups like food workers, cannot be separated from influences in the broader ecological context (Krieger, 2008). Therefore,

the success of worker-related food safety strategies relies not only on considering workers' on-the-job health and behaviors but *also* on considering the broader social and structural factors that shape them.

CHAPTER 3. METHODS

This dissertation answers its aims and research questions using a mix of data sources and qualitative approaches. This combination provides a richer picture of the role of food workers in food safety. In particular, a review of federal *documents* defining worker-related hazards, controls, and involvement in food safety strategies, provides a tangible illustration of how the U.S. food safety system accounts for workers in protecting food. This construction is complemented by *interviews* revealing the food-safety perspectives of workers and stakeholders that strive to improve food working conditions. The combined analysis contextualizes a legally-constructed role of workers in food safety within experiences of food work while also identifying potential opportunities to connect and advance these issues on the public policy agenda.

This first half of this chapter describes the case selection, sampling, data collection, and data analysis procedures used for this research. This information is organized according to the three manuscripts of the dissertation, which are identified as research phases and labeled as Phase 1: Document Review, Phase 2: Food Worker Interviews, and Phase 3: Key Stakeholder Interviews. In the second half of this chapter, information regarding dissertation ethical review and quality assurance procedures are presented.

3.1 *Phase 1: Document Review*

3.1.1 Document Selection

The first phase of the dissertation involved purposive selection and review of publicly available U.S. Food and Drug Administration (FDA) food safety rules (proposed

regulations to administer the Food Safety Modernization Act [FSMA]). The use of these texts represented a feasible approach for examining how the U.S. food safety system attends to the role of food workers in ensuring food safety.

The FDA proposed regulations to implement the FSMA are not currently available as a single finalized text. Signed into law in 2011, it is now the responsibility of the FDA, over the next few years, to create rules to administer the law and clarify expectations (U.S. Food and Drug Administration, 2014a). Currently, the FDA proposed regulations are moving through the notice and comment stage of the federal rule-making process, where the FDA releases proposed rules, or official details of plans to accomplish goals, to the Federal Register for the public to review and share comments (The Office of the Federal Register, 2011a). In January, 2013, two rules that discuss requirements and standards for food workers were released and purposively selected for analysis:

- Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food (Section 103, FSMA)
- Standards for Growing, Harvesting, Packing, and Holding of Produce for Human Consumption (Section 105, FSMA)

These rules fulfill part of the FSMA mandate to identify best practices to significantly reduce the occurrence of hazards for food that is manufactured, processed, packed or held by a food facility. They also outline standards for the safe production and harvesting of produce. Together, these rules describe how food production, processing, and distribution facilities must account for workers in food safety (U.S. Food and Drug Administration, 2014a).

3.1.2 Coding Scheme

Documents are coded using a framework analysis approach (Hsieh & Shannon, 2005; Pope, Ziebland, & Mays, 2000). This approach was guided by a protocol of questions and categories developed *a priori* and used to aid the identification of manifest content, or the more visible and obvious components of the text related to food workers (Kondracki, Wellman, & Amundson, 2002). Protocol questions, and the concepts they captured, were deductively derived from the literature and based on the research questions. I then developed these concepts (e.g., food workers, worker health and hygiene, sanitation, working conditions) into codes (workers as hazards, sources of hazards, worker-related controls) that would then form the preliminary stages of the codebook. These codes, and the codebook for this phase of the dissertation, may be found in **Appendix 1**.

3.1.3 Data Analysis

The preliminary version of the codebook was applied to an initial read of the full text, which included a variety of food safety content. The goal of this review was to identify specific sections of text related to food workers and study aims. During this process, I paid attention to additional concepts that emerged as relevant to the research agenda, but were not yet present in the pre-set coding categories (i.e., additional inductive codes and categories). Following this review, I extracted and combined identified sections of text for further analysis (Graneheim & Lundman, 2004).

I reviewed the included sections of text in detail. During this process, I noted where and how patterns occurred which allowed new insights to emerge. Accordingly, the codebook evolved as I carried out an iterative process of reading and coding

documents, which included refining existing codes and adding new and emergent coding categories (J. Green & Thorogood, 2009). Following this update and revision process, the final coding framework was discussed and agreed upon with support from my advisor. The coding framework was applied to a sample of text and, for quality assurance purposes, reviewed in a second discussion with my advisor and a member of my dissertation committee with legal training. Once the codebook was finalized, I applied the codes to all worker-related and extracted text. A second coder was trained on the codebook, and an initial coding of this sub-set of text was compared for quality assurance purposes. Coders showed strong agreement, where the same sections of text were coded with the same set of codes for 8/10 coded pages. The remaining sections of text that were found to be ambiguous (included use of different codes or differently coded sections of text) were re-coded after review, discussion, and consensus among colleagues, including my advisor and select committee members. A guide that I developed to support second-coder training, and an example of coded regulatory text are presented in **Appendix 2** and **Appendix 3**, respectively.

Following coding, I reviewed the text for each category and developed brief memos to organize data patterns and emerging interpretations on what the content was about, particularly in relation to the role of the worker in food contamination and safety (Kondracki et al., 2002). From these memos, themes were constructed based on the underlying meanings, assumptions, and potential implications of food safety procedures for workers, the food safety system, and in relation to study aims and literature.

3.2 Phase 2: Food Worker Interviews

A number of studies have examined the impact of knowledge and training on food workers' food safety behavior in the U.S. and UK. Across this research, authors conclude that food safety needs to be improved and food safety training is needed, but it does not always translate into proper food safety behavior. (D. Clayton & Griffith, 2002; Hertzman, 2007; Howes, McEwan, Griffiths, & Harris, 1996). These studies indicate that while workers' knowledge and skills are important, additional consideration is needed for the context in which workers' behaviors and food safety processes occur.

A limited number of food worker studies have looked beyond individual-level factors to consider the environmental influences on food safety behaviors (Carpenter et al., 2013; L. Green et al., 2005; Howells et al., 2008; Pragle, Harding, & Mack, 2007). These studies consider factors in the immediate workplace, including time pressure, structural facets of the work space (location of sinks), access to equipment, resources (gloves and soap), and issues with management for their impact on workers' ability to handle food safely. While these studies begin to rethink the framework by which we consider workers in food safety, this phase of the dissertation goes further by exploring workers' perceptions of food safety practice within the context of workers' everyday lives and working conditions.

3.2.1 Participant Selection and Recruitment

Participant eligibility criteria included English-speaking adult (age 18 or older) food service workers in Baltimore, Maryland. The types of food service facilities that were included were broadly defined and included full-service, fast-food, and carry-out restaurants, as well as catering groups. Within facilities, eligible workers were those who

touched food as a part of their everyday work responsibilities, including positions such as deli clerk, baker, kitchen and prep manager, cook, prep cook, pastry chef, head chef, and server. To help ensure that participants had been exposed to the food work environment and food safety procedures, eligible workers were also those who had held one of these positions for at least three months.

Food workers in the food service sector were included according to a criteria-based selection strategy (Maxwell, 2005). This type of sampling served as an efficient approach for identifying workers that may provide the information needed to inform study aims. Specifically, food service workers are regulated by the FDA Food Code, which may triangulate workers' food safety perceptions to the way in which they are described and regulated within food safety legislation (including FDA proposed regulations, which shape and inform the FDA Food Code). Further, by selecting workers who directly handle food, the study may include the perspectives of those most directly tied to food safety issues as a part of their regular responsibilities.

Recruitment

I posted advertisements on Baltimore's Craigslist to request participation from eligible food workers. Craigslist.org is a classified advertisements website that includes sections on jobs, housing, personals, for sale, items wanted, services, community, gigs, resumes, and discussion forums. As of 2012, the site is available in 70 cities and 700 countries ("Craigslist," 2014). To access the site, individuals must have access to the internet; however, the site is free to browse. Craigslist is estimated to achieve 30 billion page views per month and is ranked as the 12th most popular website in the U.S. (Alexa.com, 2014; Worthen, 2013).

I conducted 25 semi-structured in-depth interviews, which required repeated posting of recruitment ads and ongoing facilitation of interviews through follow-up emails and calls with potential participants. This sample size was determined based on an estimate of participants needed to achieve well-saturated data based on the narrow scope of the study, the nature of the study topic (easy to understand), and the likely high quality of data or rich participant responses (Morse, 2000). The recruitment script for this study, including how it appeared on Baltimore's Craigslist, is available in **Appendix 4**.

From March 2014 – April 2014, study recruitment scripts were posted in the “domestic gigs” sub-section of the community section on Baltimore's Craigslist website. Responses to these announcements were immediate (within 15 minutes) and abundant (5 inquiries on the first day). Repeat postings were necessary due to the high volume of other postings received by the site on a given day. These postings “bump” previous ads down the list, where they are less visible to potential participants. Research on recruitment-by-Craigslist therefore suggests posting multiple or repeat ads to facilitate recruitment (Worthen, 2013)

Despite the ease of this recruitment process and participant identification, I experienced a number of issues associated with interview scheduling. Specifically, while most participants were responsive and in touch during scheduling, which occurred by email and phone, 4 participants requested to change interview start times at the last minute, 2 arrived up to two hours late, and 2 cancelled interviews the day of (and requested to reschedule). An additional two potential participants responded to the research study posting, but did not schedule interviews.

In response to these events, I strived to keep my schedule open and flexible during the data collection period, including requesting interview rooms from 9am to 5pm (when possible) and staying on campus or at other interview sites (e.g., public libraries) for at least two hours following a scheduled interview where a participant failed to show. In some cases, participants would also respond to recruitment advertisements with a request to meet the same day. For these cases, I learned to be ready at all times, including charging my recorder, preparing interview materials and incentives, and securing interview space on a nightly basis.

In three instances, I scheduled an interview with a potential participant who then arrived to the interview with a friend, partner, or spouse. This individual was introduced as someone who also worked in food service, met eligibility criteria, and was interested in completing an interview. Using the preparation and scheduling strategies described above, these experiences were accommodated and included separate interviews (where one participant waited in a separate space, such as the school café, while the other completed a confidential interview). Across the participants that were recruited and interviewed in this manner (3 total pairs), all worked in distinct food service environments and roles from their friend/partner/spouse.

Finally, given the relatively high number of food processing facilities in Baltimore, Maryland, this selection and recruitment protocol was originally designed to also include workers in this sector. As a participant population, this group may complement the experiences of food service workers and provide a fuller account of the food system workers' perspectives on implementing proper food safety procedures. Furthermore, unlike Maryland's food service workers whose food safety practice is

regulated by the FDA Food Code, processing workers would be accountable under FDA proposed regulations to implement the FSMA. Accordingly, this population may have also provided a direct point of contrast between FDA's legally-constructed role of workers in food safety (*phase 1 – Document Review*) and regulated workers' perceptions of the everyday food safety experience.

Ethical approval and recruitment phases of this study thus included Baltimore's food service and food processing workers. Following ongoing efforts to identify and interview eligible food processing workers, however, I did not receive one response or expression of interest from workers in this population. After repeated attempts at identification, it was determined, with input from my advisor, that this population would be dropped from the study. In future research with food processing workers in Baltimore, it may be useful to explore alternative recruitment approaches, including working with unions and worker advocate centers that are engaged with and knowledgeable about these populations.

3.2.2 Interview Procedures

Interviews were conducted in a public space that was mutually agreed upon and away from the worksite, including public libraries in Baltimore City and student workrooms at the Johns Hopkins Bloomberg School of Public Health. During screening, participants were informed of the study purpose and procedures through an oral consent process. All participants were provided an opportunity to ask questions, receive a copy of the consent form, and decline participation if desired. Participants were asked to provide explicit consent to allow the interview to be digitally recorded. Following the interview,

interviewees were given \$20.00 to thank them for their time. Interviews lasted approximately 45 minutes.

At the beginning of the interview, all participants were asked to complete an anonymous participant questionnaire, which was a one-page sheet of basic demographic and work-related questions (**Appendix 5**). This information contributed to study quality assurance by enriching participants' descriptive profile. The interview was facilitated through brief vignettes, or what Hughes (1998, p. 381) describes as, "stories about individuals, situations and structures which can make reference to important points in the study of perceptions." Vignettes were structured around a description of a proper food safety protocol (e.g., FDA Food Code instructions for workers' proper health and hygiene practice), followed by a comment about deviation from these instructions (e.g., sometimes a worker feels unable to follow these procedures). Participants were then prompted to explain the scenario, including factors that they perceived to impact worker behavior (e.g., "Why do you think the worker would feel this way?")

Each scenario was developed according to general principles outlined in the literature. These principles suggest that scenarios must be simple (no more than three changes to a story line) and appear plausible to participants. Greater plausibility may be achieved by representing more mundane scenarios versus eccentric characters or catastrophic events. Vignettes should also contain enough context for participants to understand the situation, though also be vague enough to require respondents to fill in pieces and define the situation on their own terms (Barter & Renold, 1999; R. Hughes, 1998). Considering that participants may initially provide socially desirable answers, I probed responses to help reveal how one would respond in a situation. This process was

further facilitated by scenarios that assumed nonconformity with food safety practices (“Your coworker feels unable to wash hands according to proper procedure”) and a reminder that such deviations are common and happen to the best food workers, an approach that may provide respondents with a sense of freedom to respond more openly (Barter & Renold, 1999).

In lieu of spending an extended period of time engaging with food workers on and off the job, this approach provided a useful and feasible alternative for generating rich descriptions and explanations of the phenomenon under study (Curtis, Gesler, Smith, & Washburn, 2000). These data also enhance findings from phase 1 (*document review*) by providing a complementary worker-based perspective on engaging food safety practices as defined by food safety regulations. Interview scenarios also represent an appropriate approach for potentially sensitive topics, such as involvement with food contamination. Specifically, participants are able to engage the issue through third party language and to decide if and when to share personal experiences (Barter & Renold, 1999). Study interview scenarios are located in **Appendix 6**.

3.2.3 Data Analysis

Following the first interview, audio files were transcribed, validated, and read from a holistic perspective to identify emergent themes to assess in subsequent interviews. During this process, I paid attention to whether the scenarios appeared to elicit participant perceptions related to the study aim and research questions. Throughout, I maintained brief memos on my thoughts and reactions to each interview (including challenges, emergent themes and patterns, and context), which informed analysis and documented my involvement in the research process.

Once interviews were completed, all transcripts were re-read, and an initial coding framework was developed *a priori* and in relation to research questions, reviews of transcripts, and insight from memos. Using an iterative process the coding framework was systematically applied to transcripts and refined to capture categories that emerged inductively from the data. All coding was conducted using ATLAS.ti 7.1.8 qualitative data analysis and research software (Muhr, 2014). A social ecological framework was used to organize data across codes. Specifically, shared themes, patterns, and exemplary quotes were considered in relation to five levels of the social-ecological model (intrapersonal, interpersonal, institutional, community, and public policy), and rearranged according to their perceived level of influence on workers' food safety practice. To ensure that all relevant data were captured by this organizing framework, this process was intentionally kept flexible and iterative.

The focus of analysis centered on the meanings that participants ascribed to the food safety process within the context of their lives and working conditions, or the broader structural or social impacts on health and/or behaviors. This analysis was not intended to reveal a relationship between participant perceptions and actual worker behaviors, which remains a contested approach to vignette analysis in the literature. Specifically, some researchers argue that connecting meaning to action oversteps the bounds of what these data are able to communicate, while others argue that people respond to vignettes (or interview scenarios) much as they would in real life (Finch, 1987; Rahman, 1996). By focusing analysis on meaning and a qualitative goal of developing rich description of the phenomena under study, this study avoids this concern.

Finally, to protect the confidentiality of participants, data were de-identified in results and reported across the entire participant sample.

Findings from this phase enrich those from phase 1. For example, interview data illuminate how workers' food safety role as constructed in the U.S. food safety system compares to this role as perceived by workers within the context of workers' lives and work (Curtis et al., 2000). This triangulation of sources and methods provides a more complete understanding of the broader phenomenon under study in this dissertation (Maxwell, 2005).

3.3 Phase 3: Key Stakeholder Interviews

Little is known about how the food safety system accounts for food workers, possibly because of a reluctance to connect this group to food risk in a way that may lead to negative consequences, such as blaming the worker. Where food workers—and poor working conditions—*have* received a lot of attention, however, is from labor-related organizations, such as food worker advocate centers, unions, and related groups (such as worker-oriented legal centers and non-profits). According to research on food worker advocate centers specifically, these organizations are abundant (numbering in the hundreds across the country) and serve workers through education, training, employment services, and legal advice. The centers also interact directly with employers to advocate for changes in wages, hours, and terms and conditions of employment (J. Fine, 2006; Marculewicz & Thomas, 2012). Increasingly, a number of worker advocate centers have partnered with other groups, such as labor unions, to increase their impact on food labor standards and to raise national awareness of poor food working conditions in the United States (J. Fine, 2011). As such, these stakeholders represent key potential policy actors

related to the dissertation research agenda and may offer a unique perspective regarding advancing working conditions as an issue of food safety on the public policy agenda.

3.3.1 Participant Selection and Recruitment

Eligible stakeholder groups were defined as worker advocate centers, unions, and related groups that focused on food workers across the five key sectors of the food system: production, processing, distribution, retail, and service. Eligible groups were also required to be highly visible and active organizations that engaged in partnerships to advance their goals. Highly visible and active groups were identified as those that have released widely-publicized reports on food workers and working conditions, engaged in nationally-recognized advocacy coalitions, and have received attention for their work and achievements in the food worker literature and national media. The purpose of these criteria were to identify participants with a range of knowledge and awareness regarding key components of the issue under study, including poor working conditions, the macro-level structures by which they are influenced, impacts of conditions on workers, and innovative means to effectuate change in the workplace.

Within eligible organizations, individuals recruited to participate were higher-level staff (e.g., director, executive director, project director, health and safety director, lead coordinator, leader and organizer) focused on food worker educational and advocacy efforts. Stakeholder representatives were also individuals that had been active in their organization for an extended period of time. The intention of these criteria was to increase the likelihood that participants may provide rich information regarding strategies—including identification of potential challenges and opportunities— associated

with food workers and connecting poor food working conditions to food safety on the public policy agenda (Curtis et al., 2000).

This selection plan represents a criteria-based approach, which is a purposive selection strategy identifying particular stakeholders and representatives because they may best inform an understanding of the issues under study (Creswell, 2007). Further, as participants represent food workers across the food system, they also provide perspectives to compare and contrast the issue across food sectors, which may help build, refine, and frame emergent theory regarding poor food working conditions as an issue of food safety (Maxwell, 2005).

Recruitment

To identify and recruit potential participants, I developed a list of organizations perceived to meet eligibility criteria based on the literature, public websites and reports, and input from personal contacts. This list was then shared with leadership from one food worker alliance organization who provided input, made recommendations, and shared contact information for some potential participants. Additional contact information was obtained through public websites and an institutional contact at The Johns Hopkins Center for a Livable Future.

From December 2013 - April 2014, eligible stakeholder organizations were contacted through email and invited to participate in interviews using a recruitment script approved by the Johns Hopkins Institutional Review Board (**Appendix 7**). The study sample size was set at 10 stakeholder groups, which reflects the estimated number of interviews needed to achieve saturation given the likely high quality of data obtained and

the narrow scope and clear purpose of interviews (Morse, 2000). Though obtaining this sample size seemed feasible, the process of recruitment proved difficult. After I sent an initial set of recruitment emails with very low response, I decided to revise the recruitment script for enhanced clarity and simplicity (e.g., details regarding the broader dissertation were removed and only text directly relevant to stakeholders was included). This script was then re-submitted to the Johns Hopkins Institutional Review board as an amendment to the dissertation study and approved for use.

Following these changes, participant response improved moderately, and most participants still required repeated contact for a response. As a general rule, participants were contacted no more than three times, including initial recruitment, a follow-up email after two weeks of no response, and a final attempt following three and a half weeks without response. To further support recruitment, I sought to enhance study approachability by offering participants my study questions in advance and requesting a shorter time frame for interviews (from 60 minutes to 40 minutes; though this change did not seem to impact interview length once participants were on the phone). In addition to these strategies, two participants agreed to an interview pending the ability to later fact check and approve transcripts. I agreed to and completed these requests. Using this overall approach, 14 stakeholder groups were contacted to identify 10 expressions of interest and interviews.

3.3.2 Interview Procedures

All stakeholder interviews were conducted by phone. Prior to initiating the interview, I explained the study purpose, expected interview time frame (approximately 40 minutes), and the intent to record the interview with a digital recorder. Oral consent was explicitly obtained. I provided study participants with the opportunity to ask questions and decline participation if desired. As a part of study consent, I also informed participants that groups would not be identified by name in the research and that no identifying information that may link findings to a particular participant would be reported.

Interviews began with a discussion of the purpose of stakeholder organizations, a description of the workers served, and perceptions regarding the most important issues faced by this population. The purpose of these questions was to help contextualize participant perceptions within and across workers in various food sectors as well as to create a richer descriptive profile of cases for quality assurance purposes. Participants were then asked about the extent to which their organization adopted a food safety perspective in their work, followed by a discussion of the challenges and opportunities for advancing poor working conditions as a food safety issue on the public policy agenda. The study interview guide is located in **Appendix 8**.

3.3.3 Data Analysis

Similar to worker interviews, thematic content analysis was used to analyze stakeholder interview data. Immediately following the completion of the first interview, audio recordings were transcribed, validated, and read to get a sense of the whole. Following this process, transcripts were re-read and notes were made on initial ideas and

concepts that described what was said in the text. These emergent ideas were further assessed in subsequent interviews. The broad categories identified during this process were consolidated into major themes and developed into an initial coding framework organized by study aims, including themes related to food safety engagement, challenges or barriers to action, and opportunities to advance the issue on the public policy agenda. This framework was reviewed and discussed with members of my committee who provided a sounding board by which to question my assumptions, to help further develop emergent themes, and to consider theories related to the policy process by which findings may be better understood (Shenton, 2004). The framework was adjusted based on input and then applied to all transcripts using ATLAS.ti 7.1.8 qualitative data analysis and research software (Muhr, 2014).

To help ensure trustworthiness in the study, exemplary quotes were identified to ground results in examples provided by stakeholders and to clarify my interpretation and understanding of these data. To protect the confidentiality of participants, data were de-identified in results and reported across the entire stakeholder sample.

3.4 Ethical Review

In July 2013, the Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) reviewed a research plan describing the dissertation research and determined that the study met criteria for Exemption under 45 CFR 46.101(b), Category (2) (**Appendix 9**). This determination was made given that the research involves human subjects in confidential interview procedures (recorded in a manner that human subjects cannot be identified) and any disclosure of participant responses beyond this research would not place subjects at risk (U.S. Department of Health and Human Services, 2010).

Under this determination, a number of steps were taken to ensure participant privacy and confidentiality. At the start of each interview, participants were offered a copy of the study oral consent form (**Appendix 10**). Each participant was then read an abbreviated form of this script, including information about the study purpose, how data were to be used and protected, the potential benefits and risks of participation, and that participation was voluntary. Following this step, participants were given an opportunity to ask questions as well as decline participation if desired. Across interviews, participants were also asked to give explicit verbal consent for interviews to be audio recorded.

Contact information for stakeholder participants (including names, titles, organization name, email, and phone numbers) was used and retained for the purposes of scheduling interviews and facilitating subsequent contact, such as transcript reviews and fact checking requested by participants. Stakeholder transcripts were also labeled using a random number generator, and a spreadsheet documenting the identity of each unique ID was maintained to facilitate aforementioned follow-up activity with contacts, but stored separately from interview transcripts.

Contact information for food worker interviews (including email addresses and, on occasion, phone numbers) was used only to schedule interviews. No other contact information was collected. This information was destroyed immediately following each interview. Food worker transcripts were labeled using numbers assigned by a random number generator.

I did not use any identifiers in the reporting and analysis of interview data. The purpose of this decision was to encourage stakeholder and food worker participation in the study and to increase the extent to which participants felt comfortable speaking about

potentially sensitive topics. On a number of occasions, stakeholder participants responded to this procedure by explaining that they were not concerned about maintaining the confidentiality of their organizational name and that engaging in these topics was squarely part of their mission. Nevertheless, across the manuscripts in this dissertation, no personal or organizational information were reported in results.

All dissertation materials were contained on a password-protected computer. Following manuscript submission and no more than one year following the final period of data collection, any remaining participant identifiers, including audio files, will be destroyed.

3.5 Quality Assurance

This research uses the Criteria for Trustworthiness as a framework for ensuring rigor (Lincoln & Guba, 1985). Concepts of reliability and validity as conceived from a positivist tradition are less relevant to the quality assurance of this dissertation, which is consistent with an interpretivist paradigm (Shenton, 2004). According to Lincoln & Guba (1985), four criteria should be pursued by qualitative researchers to test for a trustworthy study, including credibility (vs. internal validity), transferability (vs. external validity/generalizability), dependability (vs. reliability), and confirmability (vs. objectivity) (Shenton, 2004). This section considers each of these criteria and the strategies used to help ensure that they were met in this research.

Credibility

According to the positivist tradition, there is one true reality that exists regardless of the researcher's beliefs, and this objective reality should be studied in a controlled and

structured way. Through an interpretivist paradigm, however, there are multiple constructed realities and more than one way of accessing them. As such, credibility is concerned with whether these multiple constructions of reality are adequately represented in the study at hand. Strategies that help test for credibility include (1) the development of early familiarity with the culture of the institutions and groups under study (2) peer debriefing (3) the adoption of research methods that are well-adapted to qualitative investigation and (4) triangulation (Shenton, 2004).

In this research, credibility was pursued by gaining familiarity with the food safety system through a variety of activities. Over the past year, the FDA has held public meetings across the U.S. to discuss their proposed regulations to implement the FSMA. Posted online and available in a live-streaming format, I participated in these sessions when possible. Each year, the Food Safety Summit is held in Baltimore and includes sessions with food safety experts on key issues and solutions for food safety in the U.S. From April 8th-10th 2014, I attended this conference at the Baltimore Convention Center, and explored sessions related to the research agenda. Alongside these activities, and throughout dissertation development, I engaged in regular debriefing sessions with my advisor and members of my thesis committee to help broaden my vision through others' experiences and perceptions and to use these individuals as a sounding board to help recognize my own biases and preferences. As an additional component of this strategy, I presented and received feedback on manuscript 1 at the American Sociological Association Annual Meeting held in San Francisco from August 15th-19th 2014.

This research also utilized well-recognized research methods that were appropriate given the descriptive and exploratory nature of the research questions and

study objectives. As a deliberate part of the study design, the three manuscripts also sought to triangulate meaning and perspectives from multiple sources (federal regulations, food workers, and key issue stakeholders). This approach further supports study credibility by providing a richer depiction of the varied constructions of the role of food workers in food safety (Shenton, 2004).

Transferability

From a positivist perspective, transferability is understood as generalizability, or that findings from one study may be applied to other situations and severed from the context from which they come. According to the interpretivist perspective, however, exploration of specific phenomenon from a smaller number of people in certain settings reflects *relative* truths that are inherently connected to context (Shenton, 2004). In this way, to help enable readers to relate, or transfer findings to their own situations, this study documents details on the fieldwork setting, characteristics of selection criteria and participants, theoretical underpinnings, and other factors that delimit and help readers assess the extent to which findings from these contexts may be transferred to another (Lincoln & Guba, 1985).

Dependability

Related to the assumption that there is one true and static truth, positivists assert the importance of reliability in research, or the idea that if the same study were repeated in the same context and with the same participants and methods, the same results should be observed (Shenton, 2004). For interpretivists, however, qualitative findings are mutually constructed by the researcher and subject, and the context is recognized as ever-changing (Maxwell, 2005). Therefore, qualitative researchers emphasize dependability

through the documentation of study processes and the changing context in which research occurs. Toward this end, this research devotes sections of text to describing details of the research design and its implementation, including changes that were made to the original study protocol and personal reflections of the challenges and opportunities that I experienced along the way (Shenton, 2004). These details anchor investigator interpretations and procedural decisions to study context, which may allow other researchers to understand and critique the research.

Confirmability

The positivist perspective asserts that research may be performed and understood in an objective manner that renders results value free. As the qualitative researcher's comparable concern for objectivity, confirmability stresses the importance of taking steps to ensure that where possible, study findings reflect the perspectives of informants, and not just the researcher (Shenton, 2004). The point of confirmability is not to remove researcher-based values and biases, but to bring them to light through acknowledgment in the research report, including incorporation of the reasoning behind adopting one approach over another, recognition of the potential weaknesses associated with a given approach, and how data as well as concepts inherent in research questions led to work that followed and informed study recommendations. This research incorporates confirmability by grounding results in the data (including presentation of quotes to support study findings), and in the creation of memos, which included ongoing reflective commentary examining my experiences (including reasoning behind, challenges faced, and adjustments made) for each research phase (Shenton, 2004).

CHAPTER 4. MANUSCRIPT 1 - An Investigation of the Legally-Constructed Role of Food Workers in Food Safety

4.1 Abstract

Every year, approximately 48 million Americans become sick, 128,000 are hospitalized, and 3,000 die from foodborne disease (Centers for Disease Control and Prevention, 2012). Though research identifies diverse factors associated with foodborne outbreaks, one of the most common is poor worker health and improper hygiene practice (Centers for Disease Control and Prevention, 2011b). Research on social determinants of health indicates a role for living and working conditions in shaping these risks. Despite this relationship, U.S. food workers represent a structurally vulnerable population that experiences universally poor working conditions (Food Chain Workers Alliance, 2012). To start connecting these issues, we must first understand how we currently account for the role of workers in food safety. This qualitative study aims to fill this gap by describing the role of workers in FDA proposed regulations implementing the 2011 Food Safety Modernization Act—unprecedented federal action to improve food safety in the U.S. The analysis is guided by fundamental causes of disease theory, which provides a useful framework for exploring regulations within the context of the socio-structural factors that impact health and hygiene behavior. Study results may begin to change the food safety conversation by connecting the impact of macrosocial inequality on workers to food safety and public health.

4.2 Introduction

Foodborne disease represents a significant and preventable public health problem in the United States. Over the last 15 years, progress in addressing the problem has been stagnant (Centers for Disease Control and Prevention, 2012). Though there are many sources of foodborne outbreaks, food workers across food work settings have, for decades, been identified as one of the most common (Greig et al., 2007). According to the food safety literature, workers contaminate food through poor health and improper hygiene practices, including working while ill (Carpenter et al., 2013; Centers for Disease Control and Prevention, 2011b; D. A. Clayton, Griffith, Price, & Peters, 2002; U.S. Food and Drug Administration, 2000). Ensuring the safety of the U.S. food supply, therefore, is inherently connected to understanding and managing these worker-related hazards to food.

A Profile of U.S. Food Workers and Working Conditions

Approximately 1/6th of the U.S. workforce (20 million people) works in five key sectors of the food system: food production, processing, distribution, retail, and service (Food Chain Workers Alliance, 2012). Within these sectors, food service represents over half of food workers. The average food worker is a non-Hispanic white, U.S.-born person whose primary language is English and who holds a high school degree or less.

Approximately half of food workers are female and two-thirds are 44-years-old or younger. While most workers have lived in the U.S. for their entire lives, 23% were born elsewhere (Ruggles et al., 2010). Most food jobs do not require formal credentials and the food system provides opportunities to many undocumented workers that are likely underestimated in government labor data.

Across sectors, food production has been increasingly associated with foodborne outbreaks, particularly related to fresh fruits and vegetables (Lynch, Tauxe, & Hedberg, 2009). This sector employs approximately 3 million workers (the second largest sector, after service) who are identified as agricultural or farmworkers and who plant, manage, and pick raw foods, as well as raise livestock and farm fish. In addition to poor wages and working conditions, these jobs are some of the most hazardous in the nation. Farmworkers are at regular risk for heat exhaustion and stroke, and compared to the general public, they suffer higher rates of toxic chemical injury and pesticide exposure (Carroll, Samardick, Bernard, Gabbard, & Hernandez, 2005; Economic Research Service, 2008). The injury rate for agricultural work is 40% higher than the injury rate for all workers (Occupational Safety and Health Administration, n.d.). Beyond the production facilities, many hired farmworkers live in employer-provided housing, which has been found to be low quality, with crowding and poor sanitation (Economic Research Service, 2008; Quandt et al., 2013). These risks extend to significant sexual harassment problems, where reports from female farmworkers suggest they experience higher rates of sexual harassment than women in the general workforce (The Southern Poverty Law Center, 2010; Waugh, 2010). Compounding these challenges, farmworkers are exempt from basic federal labor protections, such as overtime pay requirements and protection for unionizing and collective bargaining (Farmworker Justice and Oxfam America, 2010; U.S. Bureau of Labor Statistics, n.d.a; U.S. Department of Labor, 2004a).

Although some food sector jobs provide a livable wage and opportunities for upward mobility, the majority offer low wages with little access to benefits, few opportunities for advancement and training, and significant risks to worker health and

safety (Food Chain Workers Alliance, 2012). In one survey of workers across the food chain, 79% reported lacking paid sick days, 83% reported a lack of employer health insurance, and 86% reported earning low or poverty wages (Food Chain Workers Alliance, 2012). Many food workers also find that inconsistent provision of wages and work hours challenge their ability to plan and achieve economic stability. For approximately 40% of food workers, making ends meet requires working for two or more employers for 40 hours a week and with little access to breaks (Food Chain Workers Alliance, 2012). For some production workers, wages are earned according to a piece-rate, which connects earnings to stamina and output and negatively impacts worker health and safety (Johansson et al., 2010). In addition to these factors, the majority of food workers also hold front-line positions or jobs where they engage in long hours of repetitive work with little decision-making capacity. Workers indicate that these conditions lead to prolonged experiences of illness, an inability to perform jobs adequately and safely, and a reliance on the emergency room for primary care (Food Chain Workers Alliance, 2012).

Fundamental Causes of Disease Theory, Food Workers, and Foodborne Disease

Fundamental Causes of Disease theory identifies an important role for inequalities in macrosocial variables like income, environmental exposures, education, and housing, among others, in shaping health and its distribution in a population (Goldberg, 2012). According to this theory, the social and economic reality of many U.S. food workers limits their access to key resources (prestige, money, knowledge, power, and beneficial social connections) that are critical to health protection. As a result, many food workers

face increased vulnerability to disease and injury, which also makes them a risk to the U.S. food supply (Link & Phelan, 1995; Phelan et al., 2010).

The negative health impacts of work have been recognized for centuries (Braveman et al., 2011). Less common, however, is research that describes how social and structural factors, like food working conditions, impact health in a way that directly relates to food safety, such as studies on presenteeism (i.e., working ill) (Johns, 2010). Research on presenteeism finds that working sick is related to personal and work factors, including employee status in the work hierarchy and work policies such as pay, paid sick days, attendance control, downsizing, and permanency of employment (Johns, 2010, 2011). In a systematic review of presenteeism research, Johns (2011) found that employees who perceived themselves as replaceable, held temporary status, and lacked a sense of job security were more likely to work when ill.

Though this health and work research has yet to be conducted in a food workplace, findings from a recent survey of food workers complement its results. Over half of food workers surveyed reported working while sick (53%) and attributed their behavior to factors tied to working conditions: a lack of paid sick days, a belief that one would otherwise lose her job, and threats made by an employer (Food Chain Workers Alliance, 2012). In a 2013 study of restaurant workers, researchers found that 60% recalled working while ill at some time. Working sick (with vomiting and diarrhea) was significantly associated with workers who had regular contact with food, including food preparation staff, cooks, and those in food storage (Carpenter et al., 2013). Many workers reported that they did not inform management of their illness for reasons rooted in structural conditions, such as concern about short-staffing the restaurant, lack of pay, and

fear of job or shift loss (Carpenter et al., 2013). Further, a number of studies have identified work factors such as time pressure, the structural environment, equipment, and access to resources as barriers to workers' ability to handle food safely (Carpenter et al., 2013; D. A. Clayton et al., 2002; L. Green & Selman, 2005; L. Green et al., 2005; Mitchell, Fraser, & Bearon, 2007).

The influence of structural context on worker-related food safety is reproduced in research on health hazards among food production workers, such as farmworkers. Studies on farmworker health show that this population experiences worse health outcomes than the U.S. workforce generally, including increased incidence of food-safety relevant communicable diseases like salmonellosis, gastrointestinal problems, parasites, and norovirus (Holmes, 2013; Mobed, Gold, & Schenker, 1992; Sakala, 1987). Researchers attribute these health impacts, in large part, to poor living and working conditions, including low socioeconomic status, poor access to health care, and a lack of clean bathrooms (Holmes, 2013; Mobed et al., 1992). These studies begin to characterize the influence of macro-social factors on worker-related hazards to food, but this inquiry is largely disconnected from the food safety literature and far from complete. Despite this gap, the implication of this research is clear: addressing contamination related to worker health and hygiene requires consideration of workers' living and working conditions, or the social and structural contexts that shape these risks.

Exploring the Role of Food Workers in U.S. Food Safety Systems

In 2011, the U.S. Congress enacted the Food Safety Modernization Act (FSMA), representing the largest overhaul of federal food safety laws in over 70 years. The law aims to transition an outdated and reactive food safety system into one that prevents

foodborne disease in the first place (U.S. Food and Drug Administration, 2011a). The FSMA directs the U.S. Food and Drug Administration (FDA) to create regulations that implement the law. These regulations outline how the federal government currently envisions food safety. As defined by the FDA's proposed regulations, this study's objective is to identify how we currently account for the role of food workers in these requirements and to consider these descriptions in relation to theory and literature-based social and structural influences on worker health and hygiene behaviors. These data add to the literature by outlining current regulatory assumptions about sources of worker-related food contamination and how they are satisfactorily addressed. They also contribute a structural approach to understanding health and behavior, which broadens the range of factors identified as relevant for preventing worker-related foodborne disease. The results may inform future food safety regulations and interventions as well as better account for and support food workers in this process.

4.3 Methods

Documents

In accordance with federal rulemaking, a key process by which the federal government implements policy, Congress has directed the FDA to develop rules that administer the FSMA (Carey, 2013). At the time of writing, the FDA has published proposed rules to fulfill this responsibility. Five of these rules represent the central framework for a new food safety system in the U.S. (U.S. Food and Drug Administration, 2013b). Among these documents, the two rules that discuss requirements and standards for food workers were purposively selected for analysis. These rules include (1) Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls

for Human Food (Section 105, FSMA) and (2) Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption (Section 103, FSMA). The remaining proposed rules focus on issues such as foreign supplier verification, intentional adulteration, and accreditation of third party auditors and were not considered directly informative to the study aims.

The two selected proposed rules outline requirements for workers to ensure safety of (1) human food that is manufactured, processed, packed, or held by a food facility and (2) in the production and harvesting of produce (fruits and vegetables) (**Table 2**) ("Current good manufacturing practice and hazard analysis and risk-based preventive controls for human food," 2013; "Standards for growing, harvesting, packing, and holding of produce for human consumption," 2013). Though these requirements apply directly to workers in production, processing, and distribution sectors, as a part of a food system, they impact food workers and food safety broadly.

Table 2. Description of Proposed Rules Studied

<i>Proposed rule</i>	<i>Purpose related to workers</i>
(1) Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food (78 Fed. Reg., 3646)	Propose modern, science-, and risk-based preventive controls for workers handling human food to address foodborne disease.
(2) Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption (78 Fed. Reg., 48637)	Propose regulations for personnel qualifications and training, health and hygiene, and sanitary facilities that may ensure safety for raw fruit and vegetables.

Content search strategy

Proposed rules are structured with preambles, which include a summary of the issues and actions being considered, invitations for public comment, and supplementary information, such as the legal authority for rules, cited data, and compliance dates (The Office of the Federal Register, 2011b). Following the preamble, rules include regulatory text, or proposed amendments to the prevailing law. In this study, regulatory text across the two proposed rules was reviewed for content on the role of workers in food safety and contamination, including text discussing worker health, hygiene, and related behaviors or practices; sanitation behaviors and practices; workers' social and structural context, such as living and working conditions; and any other text identified as related to study aims. In limited instances, proposed regulations concluded that some current worker requirements were "sufficient to address any [food safety] hazards" (78 Fed Reg., 2013, p. 3743). These current regulations were located in the Code of Federal Regulations and included in the analysis ("Current good manufacturing practice in manufacturing, packing, or holding human food," 2013). **Table 3** outlines text identified as meeting study search criteria [located on the following page].

Table 3. Text Related to Food Workers

<i>Proposed Rule or Regulation</i>	<i>Part, Subpart</i>	<i>Section or Subsection</i>
Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food (78 FR 3646)	Proposed Revisions to Current Good Manufacturing Practice Requirements of Part 110 (Proposed Part 117, Subpart B, p. 3714)	§ 117.10 Personnel § 117.35 Sanitary Operations § 117.37 Sanitary Facilities and Controls
	Proposed New Requirements for Hazard Analysis and Risk-Based Preventive Controls (Proposed Part 117, Subpart C, p. 3730)	§ 117.126 Requirement for a Food Safety Plan § 117.130 Hazard Analysis § 117.135 Preventive Controls for Hazards That Are Reasonably Likely To Occur § 117.155 Requirements Applicable to a Qualified Individual
Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption (78 FR 48637)	Regulatory Approach (IV. p. 3522)	A. Qualitative Assessment of Risk B. Focus on Biological Hazards
	Proposal (V, p. 3534)	C. Standards Directed to Personnel Qualifications and Training D. Standards Directed to Health and Hygiene L. Standards Directed to Equipment, Tools, Buildings, and Sanitation
Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food (21 CFR 110)	General Provisions - Personnel (Subpart A, Sec. 110.10)	110.10a Disease Control 110.10b Cleanliness (b1-b8)
	Buildings and Facilities – Sanitary facilities and controls (Subpart B, Sec. 110.37)	110.37a Water supply 110.37b Plumbing (b1-b5) 110.37c Sewage disposal
Note: The remaining sections that were not included related to plant and grounds, equipment, food recall plans, definitions of a qualified facility, recordkeeping requirements, foreign facilities, and other issues, such as non-worker hazards (e.g., soil amendments, domesticated and wild animals, agricultural water).		

The search criteria and identified text were discussed and agreed upon with my advisor and a dissertation committee member with legal training. I also read FDA

guidance for industry on sub-parts of proposed rules to compare FDA thinking with my interpretation of the proposed regulations.

Coding and analysis

Selected text was coded and analyzed according to a framework approach. This approach supports policy-relevant qualitative research that begins deductively with pre-set study objectives (Pope et al., 2000). A coding framework was developed with five main coding categories (1—workers as hazards, 2—living and working conditions as hazards, 3—hazard controls, 4—authority, and 5—regulatory frame) (Maxwell, 2005). Four of these organizational categories were used to identify and sort data on concepts that were considered objectively clear (1-4). The additional category (5) was added to capture content on how the FDA frames and influences the definition of food safety in relation to workers, which was considered to require subjective interpretation.

For quality assurance purposes, a second coder was trained on a framework that included the four main objective codes (1-4), but excluded the subjective code (5). Two coders independently and systematically applied these codes to text using Atlas.ti 7.1.8 qualitative data analysis and research software (Muhr, 2014). For this process, the lead author provided documents that demarcated the beginning and end of selected regulatory text. This step was seen as necessary as federal regulations often include regulatory and non-regulatory content within a single section of text. Overall, coders had high agreement on all objective codes (1, 2, and 4) with the exception of one (3—hazard controls), which was found to capture the intended text plus additional data related to the omitted category (5—regulatory frame). In discussion with the second coder, it was determined that this additional text was seen as relevant to the study aims, but without an appropriate category

for inclusion. After explaining the omission of coding category 5—regulatory frame, these discordances were clarified and agreed upon by coders. Throughout the process, memos were created to examine patterns within data and to record emerging interpretations and ideas for analysis. The finalized body of coded text was reviewed for themes related to study objectives and social determinants theory, and for any concepts that emerged separately from these frameworks.

4.4 Results

This section outlines the themes identified on the role of food workers in food contamination and safety according to FDA proposed regulations. Based on study aims, coding categories, and the guiding theoretical framework, these themes are organized into 4 categories: (1) food workers as a hazard to food safety (including through health, hygiene, living and working conditions), (2) controls for worker hazards, (3) authority to define and implement worker controls (e.g., disciplines, institutions, and stakeholders), and (4) the regulatory frame guiding federal interpretation of food workers in food safety.

1. Food Workers as a Hazard to Food Safety

The proposed regulations predominantly discuss workers as a hazard to food at the individual level, or through their health, hygienic practices, and food handling behaviors. To a lesser extent, elements of workers' social status, such as literacy and language, are considered. Beyond these factors, the proposed regulations mention elements of food working conditions as factors that may influence workers' ability to handle food safely. This section outlines these results, which together define how the proposed food safety system accounts for workers as hazards to the U.S. food supply.

1.1 Worker Health, Hygiene, and Behavior as Hazards to Food

Proposed regulations predominantly define the source of worker-related hazards as located within the individual. Individual-level hazards as described include workers' bodies, clothing, health status, hygiene, hygienic or health behaviors, and certain elements of workers' social status.

1.1.1. Worker bodies, health, and personal effects

At the most basic level, workers are classified as a source of food contamination because of various factors related to their bodies and health. These factors begin at the biological level, and include workers as a source of food contamination because "humans (i.e., workers and visitors) can be carriers of foodborne pathogens," including bacteria, parasites, and viruses (78 Fed. Reg., 2013, p. 3523). Workers' health and bodies are further described as hazards because in addition to being direct sources of food contamination, they may also transmit diseases to other workers, who may then transmit them to food. Routes of foodborne pathogen transmission, which are labeled as poor worker health, are defined as "an illness, open lesion, including boils, sores, or infected wounds, or any other abdominal source of microbial contamination" (78 Fed. Reg., 2013, p. 3802).

The proposed regulations also recognize a role for workers' personal clothing or outer garments as factors that may harbor disease. In discussing standards for personnel harvesting, packing, and holding of raw fruits and vegetables, proposed regulations indicate that clothing may be contaminated with pathogens during work, and that "such contamination could be transferred from the clothing to [food]" (78 Fed. Reg., 2013, p. 3558).

1.1.2. Worker hygiene and behavior

The proposed regulations identify workers' hygiene as well as hygienic and other behaviors as hazards to food. Proposed regulations described these hazards as "poor hygienic practices," "inadequate personal hygiene," "poor worker hygiene," and "inadequate hygienic practices among workers." These hazards are further broken down into specific behaviors, such as improper hand-washing (e.g. rinsing hands without using soap), improper glove maintenance (using gloves that are unsanitary or not intact), and touching food with bare hands. The proposed regulations cite research on individual-level sources of risk, such as a worker's "false sense of security" when using gloves, which can lead to unsanitary practices like "wearing the same gloves for an extended period of time without cleaning them" or washing hands infrequently (78 Fed. Reg., 2013, p. 3559).

Worker behavior is also labeled as a hazard more broadly. Proposed regulations discuss an increased likelihood of food contamination from workers' "unsafe produce handling and storage practice," such as working while ill or touching food or food contact surfaces and not "[following] the correct food safety protocol." They also implicate workers for "[failing] to identify a situation that may result in contamination of food that is grown, harvested, packed, or held" (78 Fed. Reg., 2013, p. 3554).

1.1.3. Workers' social status

To a limited extent, proposed regulations mention a role for workers' level of education and literacy as relevant to food safety. These factors are not explicitly described as direct hazards to food, though they are mentioned as factors that may impede effective implementation of food safety activities, such as food worker training. For example, in describing the development of new food safety training materials, the

proposed regulations talk about the expectation that they are designed in a way to “help overcome literacy issues” (78 Fed. Reg., 2013, p. 3554).

1.2. Social and Structural Conditions as Hazards to Workers

Although the majority of selected text discusses workers as a direct hazard to food safety (through individual health, hygiene, behavior, clothing, and social status), there are sections of the proposed regulations that consider how social and structural factors may influence workers as hazards, primarily worker hygiene and related behaviors (as opposed to impacts on worker health). As defined by the proposed regulations, the considered factors are limited to the immediate work environment and relate to physical facilities, resources, and certain characteristics of jobs and working conditions in the production and processing sectors (e.g., agricultural or farm work).

1.2.1. Physical facilities

Proposed regulations mention aspects of the physical work environment that may influence the likelihood that worker-related hazards lead to contamination. For example, some sections identify a role for inadequate sanitary facilities, such as hand washing stations and toilets. At a fundamental level, the regulations comment that a sanitary facility “produces waste that can lead to contamination” (78 Fed. Reg., 2013, p. 3593). Thus, inadequately functioning sanitary facilities are identified as those that do not contain runoff and that may then contaminate food, soil, and water. In explaining these structural hazards, the proposed regulations describe, “a portable toilet facility that leaks or a fixed toilet facility that lacks proper drainage or backflow devices” (78 Fed. Reg., 2013, p. 3592).

The idea of an inadequate facility was extended to consider facilities' location or distance, frequency of cleaning, and the appropriate number of toilets and hand washing stations. For example, proposed regulations mention that sanitary facilities can be sources of hazards if their placement does not account for the layout of a production facility, or in the case of fruits and vegetables, that "the growing area of a farm may spread across several acres of land" (78 Fed. Reg., 2013, pp. 3592-3593).

Work building and equipment design are also considered as hazards to worker-related food safety. The influence of "improper design" is characterized as food contact surfaces and related workplace equipment that are difficult for food workers to access and clean (78 Fed Reg., 2013, p. 3803).

1.2.2. Resources

Proposed regulations included some consideration for how inadequate resources in the work environment may influence food workers as sources of food contamination. These resources fell into two main categories: health and hygiene-related resources and training-related resources.

Discussion of hygiene-related resources as a hazard was limited to gloves and water. A brief section of text explained that gloves, themselves, "can transfer pathogens to [food] if the gloves become contaminated." As a result, the proposed regulations recognized a role for gloves, when "dirty and damaged," to influence the extent to which workers may handle food safely. The proposed regulations also consider a role for water quality in shaping worker-related hazards such as hygiene practices.

Training is also identified as a factor that may influence the extent to which workers' education level and literacy are hazards to food safety. Worker training and training materials are described as hazards when they are designed and delivered in a way that "the person receiving the training cannot understand it" (78 Fed Reg., 2013, p. 3555).

1.2.3. The nature of jobs and working conditions

Apart from inadequate facilities, equipment, and resources, proposed regulations reserve a limited amount of text to discuss workers' day-to-day working conditions and the nature of agricultural jobs as potential sources of influence on workers as hazards to food safety.

One proposed rule focuses specifically on workers in produce packing, processing, and holding facilities. Work schedules, in relation to the farm work environment (e.g., "workers may be in growing areas for extended periods of time"), are specifically considered as factors that may impact worker-related food safety, such as workers' hygiene practice and including proper use of sanitary facilities (78 Fed. Reg., 2013, p. 3593). There is also mention that farm work is done predominantly outside, and that the nature of this environment may influence the extent to which workers become hazards for food. The proposed regulations explain,

The outdoor nature of many areas where covered activities take place naturally presents workers with situations where they will get dirt on their hands, and workers may be routinely handling food, with their bare hands, that will not be cooked to adequately reduce pathogens (78 Fed Reg., 2013, p. 3559).

Beyond day-to-day working conditions, a few sections discuss the "transient nature" of agricultural jobs as a factor that may influence the ability of food facilities to address

worker-related food hazards. Proposed regulations describe situations where farms “employ contracted harvest crews” and workers “move from farm to farm under the employment of the harvest crew company,” a factor that is suggested to complicate delivery of food safety training (78 Fed. Reg., 2013, p. 3556). Thus, the proposed regulations identify agriculture’s transient employment arrangements, including workers that are temporary, part time, seasonal, and contracted, as factors that may influence workers as hazards to food (78 Fed Reg., 2013, p. 3633).

2. Controls for Worker-Related Hazards to Food Safety

Proposed regulations identify controls (or requirements) that are described as sufficient to, “significantly minimize or prevent [worker-related hazards] associated with foodborne illness or injury” (78 Fed Reg., 2013, p. 3730). In defining factors that must be managed to reduce worker hazards, these controls further outline federal-level interpretation of the sources of—or the primary factors shaping—the role of workers in food contamination. In this section, results are organized into two categories: (1) controls that target individual-level sources of worker hazards and (2) controls that target social/structural sources of worker hazards.

2.1. Controls that target individual-level factors

Across the range of proposed controls for worker-related hazards, most focus on the individual level. Specifically, these controls explain poor worker health, hygiene, and inadequate hygienic behaviors as issues of low knowledge and skill and that are controllable through education and training. For example, highlighting the perceived importance of food safety knowledge in shaping worker-related contamination, the proposed regulations explain,

Educating personnel who conduct covered activities in which they contact covered produce and supervisors about food hygiene, food safety, and the risks to produce safety associated with illnesses and inadequate personal hygiene is a simple step that can be taken to reduce the likelihood of pathogens being spread from or by personnel to covered produce (78 Fed. Reg., 2013, p. 3554).

In addition to food safety education, the proposed regulations highlight a role for specific hygienic practices (or behaviors) as methods for “maintaining cleanliness,” managing hazards of health and disease, and ensuring sanitation (78 Fed. Reg., 2013, p. 3802). To maintain cleanliness, workers are instructed on proper outer garment use, jewelry use, hand washing, glove maintenance, use of effective hair restraints, the storage of personal clothing, belongings, or equipment, where they may eat, chew gum, drink, or use tobacco and to take precautions to prevent food contamination from other “foreign” substances, including sweat, hair, cosmetics, tobacco, chemicals, and medicine applied to skin (21 C.F.R. pt. 2, 2013; 78 Fed. Reg., 2013, p. 3802).

With regard to further controlling worker health and disease, ill workers are to be “excluded from operations where their presence could lead to contamination of food,” and they are instructed to “notify their supervisor(s) (or responsible party) if they have, or if there is a reasonable possibility that they have, an applicable health condition” (78 Fed. Reg., 2013, p. 3743). The proposed regulations also outline that food facilities should ensure sanitation through development of procedures that ensure that workers “do not touch insanitary objects (e.g. waste, trash cans, the floor, and restroom fixtures or surfaces) and then food, food contact surfaces, or food packaging materials,” without first washing hands (78 F.R., 2013, p. 3742).

Similar to requirements for food safety education, the proposed regulations aim to ensure food safety knowledge and behavioral requirements through training, a focus that underscores the federal government's perception that worker knowledge is central in shaping food workers' health and hygienic behavior as sources of contamination. As the agency asserts,

Because ensuring that covered produce is not contaminated is dependent on personnel following proper food safety and hygiene practices, all personnel who contact covered produce and food-contact surfaces must receive training (78 Fed. Reg., 2013, p. 3555).

Alongside instruction on food safety, the aforementioned hygienic practices, and “the danger of poor personal hygiene and insanitary practice,” the proposed regulations also call for worker training on how to recognize, inspect, and correct various food, equipment, and food container hazards (78 Fed. Reg., 2013, p.3802; 78 Fed. Reg., 2013, p. 3554-3555). Together, this instruction represents what proposed regulations identify as minimum qualification and training standards necessary to minimize worker-related risks for food contamination.

By focusing on training and adherence to specific sanitary practices, the proposed regulations construct worker knowledge and skills as primary factors that determine the role of workers in food contamination, or poor worker health and inadequate hygienic practice.

2.2. Controls that target social/structural factors

Proposed regulations describe controls for certain social and structural factors identified as impacting workers' ability to handle food safely. These controls relate to: (1)

sanitary facilities, such as toilets and hand washing stations, and (2) training materials and schedules. Together, these controls identify regulatory interpretation of the range of social and structural factors that are relevant to the role of food workers in food safety. They also outline the boundaries of perceived responsibility for the U.S. food safety system in relation to addressing worker-related food contamination.

2.2.1. Adequate sanitary facilities

Proposed regulations assert that controlling worker-related hazards requires adequate and readily accessible worker toilets and hand washing stations. The proposed regulations define adequacy through a number of detailed facility specifications. These details cover equipment features (water that is safe, sanitary, of suitable temperature and pressure; and plumbing and sewage disposal of adequate size and design to convey waste), location and access (accessible to workers and cleaning services but away from water sources, distribution systems, and “at a reasonable distance from growing and packing areas”), and overall quality (clean, well-maintained, and stocked with soap, toilet paper, and drying devices) (78 Fed. Reg., 2013, pp. 3803-3804). Though requirements related to the specific number of toilets to number of workers, maximum worker-to-restroom distance, and facility cleaning frequency are not specified by the proposed regulations, the text connects these factors to food safety by pointing out that these requirements are to be attended to as prescribed by the Occupational Safety and Health Administration (OSHA) under the Occupational Safety and Health Act (specifically, 29 CFR 1928.10).

For these facility and resource requirements, proposed regulations explain the influence on workers’ food safety-related behaviors: “workers are more likely to use

toilet facilities that are clean, well-stocked, and in good condition” (78 Fed. Reg., 2013, p. 3592). In addition to controls for sanitary facilities, proposed regulations require that food contact surfaces be designed in a way that is cleanable (78 Fed. Reg., 2013, p. 3523; 78 Fed. Reg., 2013, p. 3804). Together, these sections indicate that proposed regulations account for elements of the immediate work environment, including workplace facilities and design, in shaping the role of workers in food contamination.

2.2.2. Training materials and schedules

Proposed regulations identify requirements for the design of worker training materials. These specifications are meant to address “poor training” and incomprehension (including related to workers’ level of education and literacy issues), which are described as “likely contributing factors” to foodborne outbreaks and contamination (78 Fed. Reg., 2013, p. 3554). The proposed regulations explain these design requirements as follows:

Training could be understood by personnel being trained if, for example, it was conducted in the language that employees customarily speak and at the appropriate level of education. In some cases it may be necessary to use easily understood pictorials or graphics of important concepts (78 Fed. Reg., 2013, p. 3555).

To account for these resource-related and worker-related hazards together, proposed regulations call for the creation of training materials that are “... standardized, multi-formatted, and multi-lingual, and available in pictorial format” (78 Fed. Reg., 2013, p. 3554).

In addition to training material design, the proposed regulations outline requirements for training schedules to address the transient nature of agricultural work. Specifically, to account for temporary, part time, and seasonal agricultural workers, the

proposed regulations specify that training must be made available upon hiring, at the beginning of each growing season, and periodically thereafter. In the case of workers that are employed on farms through harvest crew companies, the FDA outlines expectations that these companies provide training and its verification to farms (78 Fed. Reg., 2013, p. 3556).

3. Authority in Worker-Related Food Safety

The proposed regulations specify a variety of stakeholders, disciplines, and knowledge requirements that are seen as authoritative for developing, implementing, and controlling the food safety process. In this section, indications of federal government perception about whom and what should have power in worker-related food safety are described according to two main themes: (1) authorities assigned to create, manage, and define food safety and (2) food-safety relevant qualifications and expertise.

3.1. Authorities assigned to create, manage, and define food safety

As a central part of the proposed regulations, facilities are required to develop written food safety plans. These plans document information about the preventive controls for a given facility, which include evaluations of food safety hazards, controls, and steps to monitor controls and to correct problems when they may occur. The proposed regulations described these plans as intended for use by auditors, inspectors, and a facility food safety team (discussed further under *3.2 Relevant qualifications and expertise*). They are also seen as tools for employee training, or to “make employees aware of food safety hazards” (78 Fed. Reg., 2013, p. 3733). As a whole, the food safety plan defines the food safety structure and process for a given food facility, including the role of workers in this system. Though this plan impacts and relates to all stakeholders of

a facility, the authority to design and ensure requirements—including those for workers—is given to the owner, operator, or agent in charge of a facility.

3.2. Relevant qualifications and expertise

In addition to being in a position of management or the owner, operator, or agent in charge of a facility, proposed regulations identify specific industries and disciplines that command authority in defining and ensuring food safety. For example, in developing food safety plans, proposed regulations allow involvement from “outside experts,” which are defined as trade and industry associations, independent experts, and regulatory authorities (78 Fed. Reg., 2013, p. 3730). The proposed regulations also mention that plans may be defined using a food safety team, which may include people who “bring specific expertise important in developing the plan.” Eligible team members are described as a microbiologist who understands microbial hazards, an engineer with knowledge of heat treatments, and a maintenance supervisor who understands metal contamination (78 Fed. Reg., 2013, p. 3731).

All identified experts are subject to proposed regulation’s definitions of a “qualified individual.” This title outlines the type of knowledge perceived to be relevant to define and ensure food safety for a given food facility. The proposed regulations explicitly state that this knowledge, which relates to food safety controls, hazards, and their associated monitoring and corrective actions, requires “scientific and technical expertise developed through training, experience, or both” (78 Fed. Reg., 2013, p. 3731).

4. The Food Worker Regulatory Frame

The types of hazards, controls, and sources of authority that are included in the proposed regulations, and define the role of workers in food safety, are shaped by FDA interpretation. This interpretive filter exists in FDA decisions about which data are used to inform regulations, the definition of the scope of the problem and its solution, and the perspectives and language used to explain worker-related controls and hazards.

4.1. Data considered relevant to food safety regulations

The proposed regulations are described as comprehensive and science-based. They are built from a foundation of literature that is identified by the FDA as relevant to food safety. These data are defined as food safety data that are available, which may indicate that proposed regulations are limited to evidence from studies and perspectives under the food safety umbrella, such as those currently indexed within food safety journals. The selection and interpretation of these data are further shaped by the backgrounds and training of the FDA personnel in charge of drafting the proposed regulations.

4.2. Definition of the scope of the problem and its solution

The problem of food contamination, including interpretation of the role of food workers, is oriented around identifying and controlling biological hazards that occur at the point of the farm or within the walls of the food facility. Hazards are defined as known, reasonably foreseeable, and reasonably likely to occur and they are analyzed with food as the focal point, or, “for each type of food manufactured, processed, packed, or held at the facility” (78 Fed. Reg., 2013, p. 3732). Hazard analysis in relation to workers, therefore, is considered at the point of worker interaction with food, rather than at other

levels of the food system process, such as broader social and structural factors shaping workers' health and hygiene practice.

4.3. *Perspectives and language for worker-related controls and hazards*

In limited instances, the proposed regulations include statements of opinion or make choices about appropriate language that reveals what may be dominant perspectives on the genesis of poor health and hygiene behaviors in the food safety arena. For example, the proposed regulations include documentation requirements for food safety plans. For controls to manage workers who are ill or infected, the proposed regulations make an exception that reveals a subjective interpretation of the ease with which human health and behavior can be understood and controlled:

A requirement in this regulation to develop written procedures for ensuring that this condition is met does not appear to be necessary, given the rather straightforward and universal nature of the controls (i.e., observe employees for signs of illness and redirect their activities accordingly) (78 F.R., 2013, p. 3743).
In another section, the provision requiring employees to report illness emphasizes

that “individual workers have a responsibility—every day—to take action to prevent contamination due to their own illness or infection” (78 Fed. Reg., 2013, p. 3557). This statement individualizes the role of the food worker in food contamination and defines workers as rationally acting individuals who have complete control over their health and hygiene.

4.5 Discussion

Proposed rules document federal agency plans to address a problem or achieve a goal (The Office of the Federal Register, 2011b). The FDA's proposed rules to implement the 2011 Food Safety Modernization Act provide valuable insight about how

the federal government accounts for food workers in food contamination and safety. These official documents include information about how food workers are legally-constructed as hazards to food and federal perceptions regarding the sources of influence for these risks, such as workers' lack of food safety knowledge and skills. Agency plans also describe methods for controlling the issue, which shapes national norms around appropriate interventions and U.S. food facility responsibility in supporting worker health and hygiene to ensure safe food.

Proposed rules provide examples of federal government perceptions that individual-level factors represent central sources of risk for food and for food workers in food contamination. For example, workers are described as direct hazards to food through poor health and hygiene behaviors, including illness, inadequate personal cleanliness and sanitation, and unsanitary clothing. Among the factors that are identified as sources for these risks, the proposed regulations focus on insufficient food safety knowledge and skills. In some sections, proper health and hygiene are defined as issues of worker responsibility. This emphasis interprets the source of worker-related food safety problems as located within (or on) food workers, which individualizes workers' responsibility for the issue as well as assumes a sense of responsibility toward food work that may not be perceived when providers of food jobs are not acting responsibly toward workers (e.g., low wages and lack of access to benefits). These dominant interpretations may relate, in part, to the FDA's reliance on a regulatory frame that is informed by food safety data and a goal to identify biological, facility-based hazards to food.

Proposed regulations provide some evidence that federal-level food safety systems account for social and structural context as a source of influence in worker-

related contamination. For example, the proposed regulations consider that workers' hygiene practice and access to training may be impacted by the physical work environment and resources (large outdoor work spaces, improperly functioning sanitation facilities), work schedules (long hours), and certain aspects of agricultural work (transient and varied terms of employment, including temporary, part time, seasonal, and contracted work). However, despite the fundamental role for other social and structural factors, such as food workers' poor living and working conditions, including low wages and lack of access to benefits like paid sick days, in shaping worker health, these factors are noticeably absent from proposed regulations' definitions of workers as hazards to food.

These legal constructions of the role of food workers in food safety, including factors that contribute to contamination, shape the types of interventions that are prioritized and perceived as appropriate to manage the issue. For example, the limited consideration for workers' social and structural context is reflected in the few interventions for adequate facility design and resources, which are identified to support food safety knowledge and proper hygienic practice, rather than to help protect and promote workers' fundamental health. Furthermore, the primary method emphasized for managing worker-related contamination is food safety training. As a core component of a prevention-oriented food safety framework, the implication of this requirement is that worker experiences of poor health and improper hygiene are rooted in a lack of food safety knowledge and skill, which may be managed largely through education.

Even though food workers are often most closely connected to opportunities and barriers to implementing proper health and hygiene practice, study findings show that proposed regulations do not involve workers in opportunities to analyze and define food

safety hazards and plans. This marginalization of workers is evident in proposed requirements that assign food safety authority to higher-level employees, and that suggest examples of food safety experts are those with training in scientific or technical fields. Given research that finds most food workers operate in front-line positions and, on average, hold a high school degree or less, these requirements systematically exclude the majority of food workers from the development, implementation, and enforcement of food safety systems in their place of work. Accordingly, the proposed regulations omit an important opportunity to learn the insider perspectives of those whose behavior and health they aim to manage and change (Mitchell et al., 2007).

Overall, the proposed regulations largely define the role of food workers in food safety through individual-level hazards and controls. These factors, including workers' level of food safety knowledge and skills, and their control through food safety training, are recognized as important elements of food control programs in the food safety literature. When contextualized within the reality that food workers often represent a deeply disadvantaged group that lacks access to resources by which they may protect their health, however, this narrow interpretation is problematic (Link & Phelan, 1995). Guided by theory on social conditions as fundamental causes of disease, food safety policy that aims to account for workers' health and health behavior must also account for the broader macro-level structures, such as poor food working conditions, by which these factors are shaped. For effective food safety interventions and long-term change, food safety policy must call for improved food working conditions, including in the form of worker pay, benefits, and treatment, as well as require and prioritize the involvement of food workers in the development and implementation of the food safety process.

There are some limits to the analysis presented that should be considered. The density and complex language of the proposed regulations may mean that certain nuances characterizing food workers in food safety were missed. However, careful and repeated review of study documents, the inclusion of second-coder verification, and input from researchers with legal training were used to help address this potential. Results should also be interpreted with the understanding that reviewed food safety provisions are in a proposed state. Though these rules may change in their final form, FDA memos and supplemental proposed rules suggest that the worker-related sections analyzed in this paper are unlikely to be revised (U.S. Food and Drug Administration, 2013e, 2014c, 2014d). Despite these limitations, the reviewed documents are instructive for understanding how the federal government currently thinks about the role of food workers in food contamination and food safety.

4.6 Conclusion

The findings from this study describe the framework by which the federal government defines and aims to manage the role of food workers in U.S. food safety systems. Despite literature documenting the impact of food workers' poor living and working conditions on worker health and hygiene behaviors, results indicate that these factors are largely absent from the proposed regulations' definitions of workers as hazards to food and interventions to prevent food contamination by workers. Even though the proposed regulations represent minimum food safety standards specifically for food production, processing, and distribution facilities, their definitions of relevant food safety authority excludes engagement from food workers, who may be able to help address

existing gaps and definitions regarding factors that impact their ability to handle food safely.

The disconnect between food workers' social and structural context and regulations to address their role in food safety represents a critical food safety issue that may lead to insufficient food protection and increased risks for worker and consumer health. Further, by defining the role of food workers in food safety as largely related to education and training, proposed regulations may support a system that responds to foodborne contamination by blaming the worker, rather than identifying and accounting for other macro-level factors that also impact workers' ability to maintain health and handle food safely.

Public health researchers can play an important role in addressing these issues. Future research should continue to build the evidence base clarifying the impact of poor living and working conditions on food workers, food safety, and public health. This work may also explore opportunities to improve the visibility of these issues among policymakers and on the public policy agenda. These efforts may benefit from collaborations among researchers and practitioners in social science and focused on food working conditions, as well as include the experiences and perceptions of food workers. Though these stakeholders are not recognized as relevant to food safety in the proposed regulations, their unique perspectives on the genesis of poor health and hygiene may help to build more effective interventions to prevent contamination by workers. Finally, public health researchers should disseminate this work by taking advantage of federal rulemaking opportunities to shape and inform federal policy, such as through participation in the public comment process.

CHAPTER 5. MANUSCRIPT 2 - Listening to Food Workers: Factors that Impact Proper Health and Hygiene Practice in Food Service

5.1 Abstract

This study investigates food workers' perceptions of factors that impact proper food safety practices. Twenty-five in-depth interviews were conducted with food service workers in Baltimore, Maryland that centered on four practices related to worker health and hygiene (proper hand washing, glove use, clean garments, and exclusion from work while ill). Food workers considered the practices and discussed factors that influenced proper implementation in the food service workplace. A social ecological model is used to organize the factors discussed and to help food safety practitioners and researchers recognize the many influences on proper health and hygiene practice. Findings include factors across the five levels of the social ecological model and include elements that have been identified in previous food worker studies. My findings identify many additional factors, however, which are largely related to the institutional, community, and policy levels. These factors include formal and informal restaurant policies and procedures, working conditions (including pay and limited access to benefits), issues with health and hygiene-related resources in the community, and certain state and federal-level policies. Results suggest that food safety interventions should adopt an increasingly ecological orientation that accounts for all factors, including workers' social and structural context, that impact proper health and hygiene practice.

5.2 Introduction

Foodborne disease is a significant and preventable public health problem in the United States. Each year, an estimated one in six Americans (48 million people) become ill, 128,000 are hospitalized, and 3,000 die from contaminated food or beverages (Centers

for Disease Control and Prevention, 2011c). The majority of foodborne disease outbreaks that are reported to the Centers for Disease Control and Prevention (CDC) are found to originate in food service facilities, such as restaurants and delis (Gould et al., 2013; Olsen, MacKinnon, Goulding, Bean, & Slutsker, 2000). Research exploring sources of these outbreaks indicates a pronounced role for food workers, particularly through what is described as poor worker health and hygiene (Bean, Goulding, Lao, & Angulo, 1996; Gould et al., 2013; Olsen et al., 2000; Todd, Greig, Bartleson, & Michaels, 2007b; Todd et al., 2008).

Interventions to prevent foodborne disease in food service establishments are determined at local, state, and tribal government levels. To support this process and achieve consistency with federal food safety policy, the Food and Drug Administration (FDA) publishes and encourages local adoption of the Food Code, a reference document that is updated every four years and provides science-based guidance to develop and update local food safety rules (U.S. Food and Drug Administration, 2014b). This document describes effective management of workers' health and hygiene through a number of practices, including hand washing procedures to reduce and remove foodborne pathogens; requirements for the use and maintenance of gloves and clean outer garments to reduce the transfer of pathogens from workers to food and other objects; and procedures for the identification and restriction or exclusion of sick workers that could contaminate food (Sumner et al., 2011; U.S. Food and Drug Administration, 2005).

To ensure that workers follow these practices, restaurants rely predominantly on food safety training (Ellis, Arendt, Strohbehn, Meyer, & Paez, 2010; Hedberg et al., 2006). While worker training may increase knowledge of proper food safety practices—

an important part of food safety control—a number of studies show that this is not enough to ensure that workers actually perform food safety behaviors (D. Clayton & Griffith, 2002; L. Green et al., 2005; Howes et al., 1996; Manning & Snider, 1993). These results indicate that the problem of worker-related food contamination is more complex than a single level of analysis or intervention, and that food control programs must consider more comprehensive approaches and account for a broader set of factors, in addition to knowledge, that may impact adherence to various food safety practices.

To identify these factors, a limited number of studies have involved workers (Carpenter et al., 2013; D. A. Clayton et al., 2002; L. Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007). In addition to training, these studies identify worker characteristics as factors that impact proper health and hygiene practice. Barriers are described as workers' allergies and dry skin (related to glove use and hand washing), dedication to the job, and fear of negative consequences, such as leaving coworkers short-staffed and losing one's job or shifts (Carpenter et al., 2013; Howells et al., 2008). Conversely, worker characteristics identified to facilitate proper practice include preferences for clean hands, motivation, pride in work, experience, age, expectations of reciprocal treatment, and concerns about consequences for the restaurant, customer and personal health, and sanitary appearance (L. Green & Selman, 2005; Pragle et al., 2007).

Beyond food workers' characteristics, these studies also account for the influence of the food work environment on workers' proper practice. The most commonly identified factors include time pressure, understaffing, high customer volume, management/coworker emphasis on proper procedures, and issues with resources and workplace design (e.g. inconvenient sink location, small spaces) (D. A. Clayton et al.,

2002; L. Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007). In limited instances, food worker studies also identify a role for the type of restaurant, customer observation of workers, restaurant procedures (e.g., food safety tracking logs and automated reminders) and other working conditions, including issues related to pay and benefits (Carpenter et al., 2013; L. Green & Selman, 2005; Pragle et al., 2007).

Altogether, these studies are important insofar as they identify group norms regarding the range of factors that may impact food safety. They also achieve worker confirmation of issues seen to be food safety facilitators and problems in the literature. Still missing, however, is research that prioritizes the workers' perceptions of issues most relevant to food safety, especially within the context of food workers' everyday lives and work experiences.

In order to address this gap, I conducted in-depth interviews with food service workers about their experiences with food safety health and hygiene behaviors, including hand washing, glove use, cleanliness of uniforms or outer garments, and requirements to report illness to supervisors and to be excluded from work when sick. This investigation is based on the social ecological model, which accounts for the environmental and policy contexts of behavior in addition to social and psychological influences (Sallis et al., 2008). Ecological models also propose that these varied layers of influence interact with each other and that multi-level interventions may be most effective in changing behaviors, such as workers' health and hygiene practices (Sallis et al., 2008).

There are different versions of the social ecological model and varying definitions of the levels of influence on behavior. In this study, I organize workers' perceptions of

factors impacting health and hygiene behaviors according to five levels, defined by McLeroy and others (1988). The first level, intrapersonal factors, includes individual characteristics, such as knowledge, attitudes, behaviors and skills. The second level, interpersonal processes and primary groups, includes workers' formal and informal social networks and support systems (e.g., family, co-workers, and friendships). The third level, institutional factors, relates to the characteristics, policies, and procedures (formal and informal) of the food service workplace. The fourth level, community factors, considers characteristics of and relationships among surrounding organizations or institutions. The fifth level, public policy factors, accounts for local, state, and federal laws and policies (McLeroy et al., 1988).

Using a social ecological approach to organize results, the goal of this study is to better understand and clarify the range of individual and environmental factors that explain workers' health and hygiene practice. My approach contributes to the literature by prioritizing workers' experiences and perceptions of the factors that influence their role as a common source of food contamination. Study findings may support the development of more comprehensive and effective food safety programs in restaurants.

5.3 Methods

The study collected data on food workers' perceptions about factors that impact workers' ability to handle food safely. Twenty-five in-depth interviews were conducted with food service workers in Baltimore, Maryland, between March and April 2014. This sample size represents an estimate of participants needed to achieve well-saturated data based on the clear topic and narrow scope of the study and the use of shadowed data, or

when participants talk about the experiences of others in addition to their own (Morse, 2000).

Food service workers were purposively sampled through advertisements placed on Baltimore Craig's List. The advertisement outlined the study purpose, incentive, eligibility requirements, and invited workers to participate in interviews during their personal, non-work time. The study advertisement included the researcher's email so that interested participants could learn more about the study and schedule a time and place to participate. Because of initial difficulty recruiting female participants, additional advertisements were created and listed for female food service workers only.

To be eligible for participation, workers had to be English-speaking adults who had prepared, cooked, or served food for at least three months in a restaurant in Baltimore, Maryland. Interviews were conducted face-to-face and in a quiet and confidential space away from the work site. Each interview lasted approximately 45 minutes and study participants received an incentive of \$20 for their participation.

Development of Food Safety Practice Scenarios

Interviews were facilitated through a set of food safety scenarios involving workers in the food service sector. Scenarios were worded to assume, rather than ask about, worker deviations from proper health and hygiene protocols (e.g., when [instead of if] a worker is unable to change gloves). These protocols focused on health and hygiene practices, including hand washing, glove use and maintenance, cleanliness of personal clothing or outer garments, and working while ill or infected, which includes recommendations to seek medical care and requirements to report illness to a supervisor

or the person in charge. Deviations from these food safety practices were selected for their identification in the food safety literature as regular sources of foodborne outbreaks in restaurants and related establishments (Gould et al., 2013; Todd et al., 2007; Todd et al., 2008).

Each scenario began with a description of the proper food safety protocol (e.g., instructions for proper hand washing procedures), followed by a comment about deviation from the practice (e.g., “Sometimes, however, food workers feel unable to follow these instructions”). Participants were then asked for their perceptions about factors that may impact the situation (e.g., “Why do you think the worker would feel this way?” and “What could be going on in this situation?”). Descriptions of the recommended food safety practices were based on the 2005 FDA Food Code, which is the version currently adopted by the state of Maryland as a model for local food safety requirements (**Table 4**) [Located on the following page] (U.S. Food and Drug Administration, 2013c). Study scenarios are located in **Appendix 6**.

Table 4. Proper Health & Hygiene Practices Discussed by Participants	
<i>Behavior</i>	<i>Recommended Practice</i>
Hand Washing	A food employee shall wash hands, scrubbing for at least 20 seconds with soap and clean running warm water and drying, in a handwashing sink at the following times: (1) immediately before engaging in food preparation, (2) during food preparation, (3) after touching bare human body parts (other than clean hands), (4) after using the toilet (5) before using gloves, (6) when switching between handling raw food and ready-to-eat food, (7) after handling soiled equipment or utensils, and (8) any other time where hands could become contaminated (e.g. touching the floor, trash cans).
Glove Use	Workers must wear gloves when they handle ready-to-eat foods. They must also change gloves between handling raw meat and ready-to-eat food. Workers must maintain gloves, or make sure they are intact, clean, and in sanitary condition.
Ensure Cleanliness of Uniform/Outer Garments	Food employees shall wear clean outer clothing to prevent contamination of food, equipment, utensils, linens, and single-service and single-use articles.
Working while Ill	A food employee is required to report to the person in charge information about their health and activities as they relate to diseases that are transmissible through food. A food employee should provide information such as date of onset of symptoms of an illness, or of a diagnosis without symptoms. The person in charge shall then exclude or restrict the [infected] food employee from a food establishment.

Interviews

Following 10 recruitment postings (5 for all workers, 5 for female only), 29 eligible participants responded, and 25 food workers were recruited and scheduled for interviews. Of the four additional respondents, 2 did not schedule interviews and two cancelled due to scheduling conflicts. Data collection was anonymous and began with the informed oral consent process followed by a brief written questionnaire to assess participants' basic demographic and job characteristics. Participants were then asked to respond to scenarios by stating factors they believed impacted each situation, or a deviation from effective implementation of recommended health and hygiene practices.

To give participants time to feel more comfortable with the discussion and interviewer, and to make sensitive questions less striking, scenarios about more sensitive topics were talked about later in the interview (e.g., working while ill). Further, as the interview inquired about undesirable behaviors associated with food safety, the discussion was introduced with a reminder that each scenario involved common behaviors that occurred even among the best food service workers. According to Green (2008), these techniques may improve data quality by reducing social desirability bias and therefore increasing the probability of accurate and honest responses. The study protocol was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Data Analysis

Each interview was digitally recorded and transcribed. Transcripts were read in their entirety and an initial coding framework was developed based on study aims and interview data. Using an iterative process, the framework was systematically applied to transcripts and refined to capture additional categories of factors that emerged inductively from the data. Using a finalized framework, each transcript was systematically reviewed and shared themes, patterns, and exemplary quotes were identified across responses. These data were then considered in relation to the five identified levels of the social ecological model and findings were rearranged according to their perceived level of influence. These categories of text, and their encompassed themes, were further organized in relation to pre-identified factors under each level (e.g., intrapersonal factors include beliefs, skills, and attitudes, etc.). This analysis process remained iterative and flexible to ensure that themes that may not neatly fit pre-determined categories were still

captured and included in results. Study coding and analysis processes were organized using ATLAS.ti qualitative data analysis and research software (Muhr, 2014).

5.4 Results

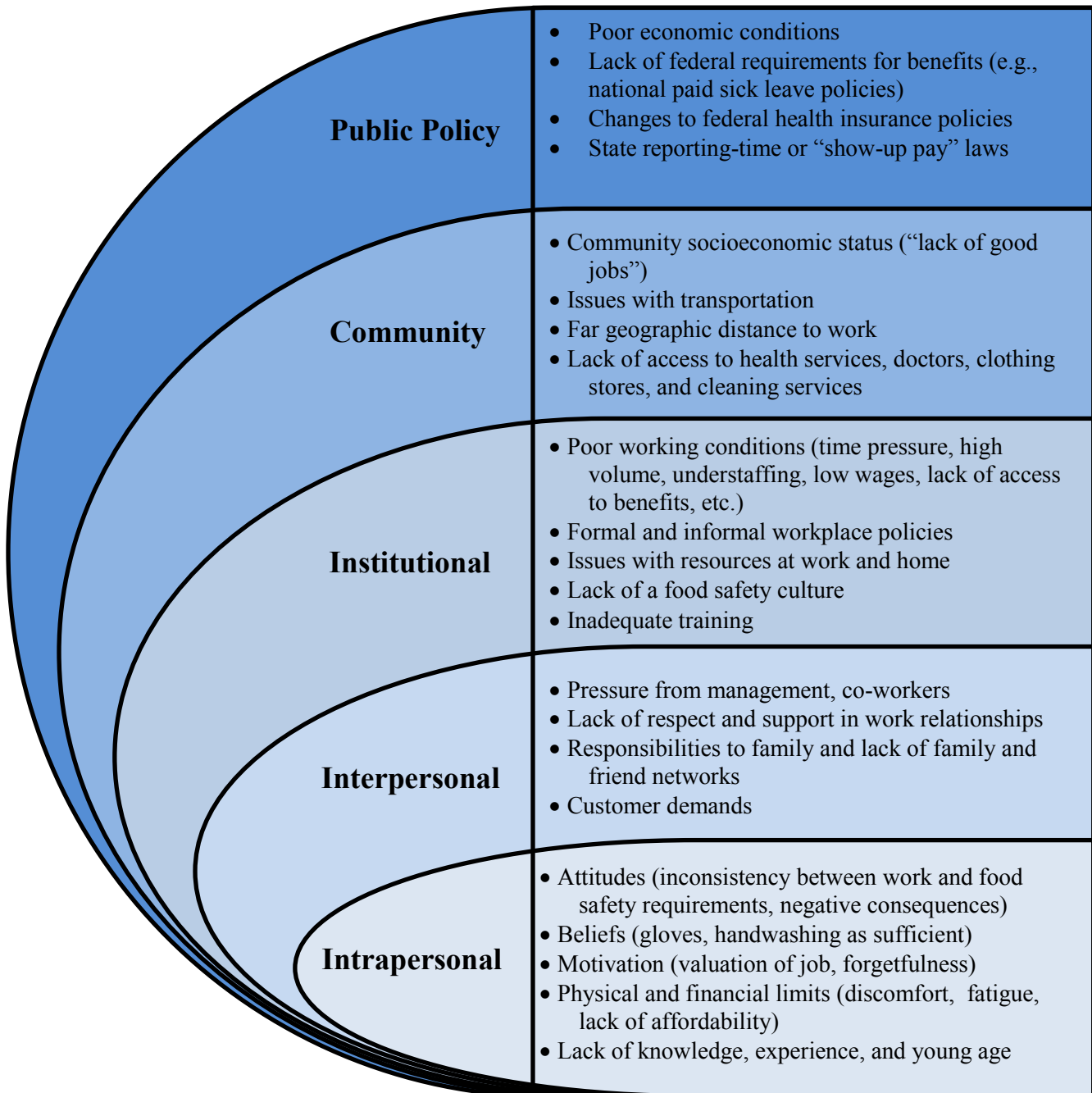
Characteristics of the interview participants are shown in **Table 5** [located on the following page]. Participants were 21-57 years of age and approximately half were male. The majority had at least vocational/technical school or some college education (60%) and almost half participated in some form of public assistance (48%). The majority of participants lacked access to paid sick days (84%) but had access to health insurance (60%), largely through providers other than their current employer (66.7%). Participants had a variety of food service titles, including cashier, deli clerk, baker, kitchen and prep manager, cook, prep cook, breakfast cook, pastry chef, head chef, owner, server (including waiter/waitress), and barista, and they varied in the amount of time that they held these roles. Across positions, participants had responsibilities that required direct contact with food, including cooking, food handling, and food storage.

Table 5. Characteristics of Food Worker Participants	
Characteristic	No. (%) or Mean (Range)
Age	31.24 (21-57)
Education	
High School Diploma	7 (28)
Vocational/Technical School or Some College	15 (60)
4-Year College Degree or More	3 (12)
Gender	
Male	13 (52)
Female	12 (48)
Participation in Public Assistance*	
Supplemental Nutrition Assistance Program (SNAP)/EBT	11 (44)
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	2 (8)
School Breakfast/School Lunch	4 (16)
Head Start	1 (4)
Supplemental Security Income (SSI)	2 (8)
None	13 (52)
Access to Paid Sick Days	
Yes	4 (16)
No	21 (84)
Access to Health Insurance	
Yes	15 (60); Food Job: 5 (33.3) Other Provider: 10 (66.7)
No	8 (32)
Don't Know	2 (8)
Responsibilities*	
Food Preparation	22 (88)
Food Storage	18 (72)
Cleaning	17 (68)
Cooking	14 (56)
Serving	11 (31)
Dishwashing	9 (36)
Length of Time in Current Position	
3 months < 2 years	13 (52)
2 to < 6 years	8 (32)
6 to < 10 years	1 (4)
≥10 years	3 (12)
*Numbers do not equal 25 because characteristics not mutually exclusive	

Factors influencing worker health and hygiene-related practices

In response to scenarios of worker deviations from food safety practices, participants identified a range of factors that they believed influenced each situation. In this section, I outline common themes that were identified across worker discussions and health and hygiene requirements. Findings are organized into the five levels of the social ecological model as indicated in **Figure 3** [located on the following page and placed at the introduction of study results as an organizing framework]. In line with core principles of this framework, some of these factors are highly interrelated and interact with factors categorized at other levels. Common factors were also identified across interview scenarios. In some cases, identified factors could justifiably be located under other levels of the model (Gombachika, Chirwa, Malata, & Maluwa, 2013) . Nonetheless, the categorization in Figure 3 was seen as the clearest way to navigate readers through participants' perceptions and experiences.

Figure 3. Social Ecological Model of Factors Influencing Worker Health & Hygiene Practice



Intrapersonal Factors

Participants described a variety of intrapersonal factors that they believed were influential in shaping worker health and hygiene practices. These factors centered on worker attitudes, beliefs, and motivation—including pride in one’s work—as well as a number of issues related to physical and financial limitations. To a lesser extent, participants talked about barriers related to worker knowledge, age, and skills.

Attitudes

Many participants perceived the actions required to meet health and hygiene requirements as impractical, especially when considered in relation to workers’ experiences at work and home. Related specifically to clean uniform requirements, one participant explained:

...it’s not like you would do laundry every single day, especially if you’re working full time, you’re not going to come home and do a full load of laundry. You won’t even have a full load of laundry to do every day, especially if you wear the same thing to work, every day. That would get washed once every week or so, and that would be that.

Almost all participants perceived food safety practices, generally, to be inconsistent with the nature of food service work. Many interviewees indicated that they were chronically challenged to balance food safety practices with other workplace responsibilities.

Participants described the issue as a “lose-lose situation” where “it’s either you get the job done, and not follow the [food safety] rules, or you follow the rules and don’t get the job done.” Some participants explained that managing this tension put a burden on workers to “bend the rules,” including rushing or skipping food safety practices altogether, especially hand washing and proper glove use.

Almost all respondents mentioned that the anticipation of negative consequences shaped health and hygiene behaviors. In some cases, the potential to make customers sick encouraged worker adherence to certain practices; one participant explained, “We don’t wanna be responsible for giving someone E. coli, so we’re gonna switch out gloves.” A few respondents were encouraged to follow procedures by putting themselves in the customer’s position: “If this was my food, I would not want anyone touching it with their bare hands.”

At other times, however, the expectation of negative consequences acted as a barrier to proper health and hygiene practices. Some workers felt that staying home from work, even when ill, would harm their reputation with supervisors. One server explained, “[Workers] want to show up to work and be a good worker, they want to look good in the manager’s eyes and be that girl that never calls up, because that’s good.” A number of respondents extended this point to other practices (hand washing and glove use) and consequences (being yelled at, losing pay and shifts, and being fired). For example, in discussing why workers may rush or skip hand washing or changing gloves, one participant said, “If you’re slow, you’re not going to last, you’ll get pushed out, they’ll cut your hours and all that stuff.”

Among a few participants who worked as chefs and cooks, it was suggested that glove use requirements may not be followed because of challenges that they create for food preparation and other food safety tasks. These workers expressed how gloves made it hard to prepare certain dishes and ingredients, handle knives safely because “gloves can make things slick,” and to gauge food temperatures because “you can’t feel as well.”

Beliefs

Beliefs regarding the effectiveness of glove use and hand washing were expressed as barriers to each practice. A few participants indicated that some workers felt gloves provided a sufficient barrier to contamination and that hand washing was redundant. As one participant summarized, “People will say, why do I have to wash my hands when I’m wearing gloves?” Another participant went on to explain the reasons for and problems with this belief:

...they feel as though my hands are not going directly on the food, it is going on the glove first, but if you don’t wash your hands, once you go to pick the gloves up, you’ve contaminated the gloves, because your hands are dirty.

Alternatively, a few participants suggested the opposite situation to be true, or that beliefs in the effectiveness of hand washing lead some workers to find gloves less important.

Motivation

Many interviewees indicated that workers’ health and hygiene practices were impacted by workers’ motivation, which was seen as either a facilitator or barrier to safe practice depending on a number of factors. For some participants, workers who saw their job as a career and who enjoyed the work were positively motivated to adhere to health and hygiene requirements. One interviewee explained,

If you have people that like their job and they enjoy what they are doing, they will make sure that everything is good. They want to make good food because they want the customers to come back because they want to be at that job.

A few participants considered the role of pride, and that workers who were proud of their food service role and culinary craft were motivated to “look presentable” and, as one

female chef remarked, “keep their station very neat and tables clean, hands clean, aprons clean, things like that.” Some participants complemented this idea by asserting that some workers did not like their job, or felt disengaged from the work, and that these factors led to “laziness” or workers who did not care about health and hygiene requirements. Still, many respondents considered the possibility that workers, regardless of their perspective on work, were forgetful, and that there are times when workers are “just not thinking about [food safety].”

Physical and Financial Limitations

Certain physical and financial limitations were also identified as barriers. Some participants described reducing the frequency of hand washing due to hand pain and dryness from repetition, sanitary soap that “eats your skin up,” and hot water. Others extended these issues to avoiding gloves because certain types “make your hands real, real, real dry.” Physical limitations were also related to whether or not some workers chose to work when ill. Specifically, a few participants suggested that their decision was influenced by the severity of the cold, such that one would stay home only if they felt unable to work through it.

As a barrier to meeting clean uniform or outer garment requirements, some workers discussed issues of personal stress and fatigue. Participants mentioned that requirements to clean uniforms after work hours may compete with rest, catching up on sleep, and managing other strain “outside of the workplace.”

Almost all participants talked about financial barriers to proper health and hygiene practice. They described requirements to regularly clean garments and not work while ill as

unaffordable and competing with needs to “pay their car payment or pay their rent,” and to generally make ends meet. In relation to requirements to not work when ill, many respondents indicated that they work sick because they could not “afford to take off.” With regard to clean uniform and outer garment requirements, some participants suggested that “most people don’t have enough clothes to constantly keep changing between stuff” and, where lacking their own cleaning equipment, “can’t afford to be able to wash their clothes all the time” using alternative means, like a Laundromat.

Knowledge, Age, and Skills

A couple of participants suggested that improper health and hygiene practice may be related to knowledge. Participants described this issue as lacking knowledge about proper practices and the reasons for requirements. A number of participants, however, stated that knowledge was unrelated to improper practice, and that workers, “knew what to do.” A few respondents suggested that proper food safety practice may be related to age, such that young workers are potentially less mature and focused on the importance of food safety compared to their older and more experienced counterparts.

Interpersonal-Level Factors

Many participants identified workers’ social relationships as influential for health and hygiene behaviors. Across all participants, workers’ relationships with managers were the most commonly discussed, though some participants also identified relationships with co-workers, customers, and families as factors that were relevant to the issue.

Relationships with Management

Workers presented food safety practices as being influenced by various manager characteristics and the nature of the worker-manager relationship. These factors were described as both facilitators and barriers to proper health and hygiene practice in restaurants.

Many participants described specific manager qualities that deemphasized the importance of food safety and impacted worker motivation and ability to follow protocols. These factors included manager apathy toward proper food safety practices. One participant asserted, “If the manager saw [signs of worker illness], they wouldn’t acknowledge it.” A server added that such disregard “rubs off” on workers: “If a manager doesn’t care that there aren’t gloves for the bread, so what if I care?” Some participants talked about experiences where efforts to report issues or meet health and hygiene requirements were met with negative responses or consequences. One cook explained,

Some supervisors can be real nasty. Mine, one time, when I told him I was sick and I said I need to go home, and he said well you can’t, because he only had three cooks on a Friday night. So I had to stay and work sick, it was either that or be suspended for a week without pay.

To avoid these situations, some participants would “pick and choose [their] battles,” try to handle issues themselves, or stop reporting or addressing food safety problems.

The majority of participants identified pressure to prioritize other food service tasks (e.g., “getting the food from the fryer to the table”) over proper food safety procedures as a barrier. A few participants who described working sick mentioned that they were encouraged by a manager to do so:

Unless the person's obviously physically very sick, chances are [the manager's] gonna say to try and stick it out, maybe take a break, go sit outside for 10-15 minutes and see if you feel any better, you know, eat something or drink some water, eat some crackers or something. She's gonna try and get them to stay.

While this pressure was perceived to reduce adherence to proper practice, some workers also empathized with managers, who they suggested were obligated to make and save money for the restaurant and had to manage workers who took advantage of rules.

A few participants who described limited barriers to proper practices attributed their experience to “good managers,” characterized as those who were available (e.g., present on work floors), consistently modeled proper food safety practices, and took ownership over associated tasks (e.g., refilling soap, restocking gloves). Across all participants, there was a general perception that manager supervision and enforcement of proper practice, such as through verbal and written reminders, promoted worker attention to food safety and adherence to safe practice. Many participants also suggested that it was easier to meet health and hygiene requirements when they had a personal relationship with managers and felt respected and valued as a team member.

Strategies identified to support these relationships included helping workers in their day-to-day tasks (“When [things] get hectic, good managers will come out and help”); talking and listening to employees, including through staff meetings to “discuss ways to make the restaurant safer”; providing workers with preferred schedules, opportunities for promotion and raises when earned, and good working conditions, including health care, vacation time, paid sick days, and equipment to prevent injury (e.g., cushioned mats to protect workers’ joints when standing).

Relationships with co-workers

Some participants indicated that co-workers often reminded them to engage in proper health and hygiene practice. For most interviewees, these efforts were real-time verbal reminders. For others, just the awareness that others were watching was enough to encourage adherence. Some participants suggested that this regulation was most effective when co-workers operated like a team and, “everyone is looking out for one another.” A few participants related this concept to family (“being your brother or your sister’s keeper”), or relationships that allowed enforcement to be more supportive than “tit for tat” or adversarial. For one participant, these relationships were afforded by working alongside the same people for years:

...It's a small owned business, so we've all known each other. One of the ladies, she's an older lady, she has been with [the owner] since he started the business. Another lady came in behind me 'cause he had started rapidly picking up, so all of us are close-knit. So we know each other 'cause sometimes you do forget [food safety practices] in your head. You're busy, and it will slip your mind, so that's where you say, "You forgot to wash your hands" or something like that. It's like family-oriented...

This perspective contrasted with many other participants who worked for larger, chain establishments with bigger workforces and regular turnover. For some of these participants, experiences of frustration and pressure from co-workers were described as factors that promoted unsafe health and hygiene practice. A few participants mentioned that co-workers would be let down or would “give you a hard time about having to leave,” when experiencing illness. Others indicated that hand washing and glove use practices were skipped or rushed because co-workers yelled at them for taking too long. Most interviewees considered these factors to be a product of interconnected responsibilities in

food service. Discussing the work-related impacts of engaging with food safety practice, one participant explained,

It might affect someone else's work. It might affect the person working with you at that station. It could affect the progress of something else that needs to be made. It could affect your co-workers' attitudes, your work environment. There are a lot of variables, a lot of things that can happen and be affected by one person or one set of policies or rules that you're supposed to be following to the T.

These participants indicated that once one person slowed down the “well-oiled system,” the consequences for business operations could be significant. For many workers, such unfavorable consequences weighed on their perceived ability to follow safe health and hygiene practice.

Customer satisfaction

Making the customer happy was described by some interviewees as the most important part of the job. One participant summarized, “At the end of the day, if the customer is not happy, you might be out of a job; before you know it, the business owner might not have a business anymore.” These respondents equated customer satisfaction with speed in getting orders filled and food out, which often impacted proper glove use and hand washing practice.

For a number of participants who worked as servers, customer-related pressure was particularly salient. Interviewees indicated that they were the face of the restaurant and “received the backlash” (including reduced tips) if food did not look right (e.g., sitting in the kitchen too long) or was not served quickly. While these issues were described as barriers to proper glove use and hand washing, however, a couple of servers suggested that

interaction with customers, and a desire for their satisfaction, may facilitate adherence to clean uniform requirements and not working while visibly ill.

Family and friends

Obligations to family were described as barriers to not working while ill. A few participants described situations where co-workers continued to handle food despite experiencing severe illness symptoms because workers “have to feed their children,” and “have a family and bills to pay.” Other participants indicated that some workers lack the family and friend networks necessary to follow illness requirements, such as accessing health care services for treatment and doctor’s notes. One interviewee explained, “[Workers] might not have a way to the hospital; they have no one to take them.”

A couple of participants suggested that whether or not a worker lived alone, or as a part of a multi-unit household, may impact adherence to clean uniforms or outer garment requirements. These participants explained that households with more participants were more likely to have consistent and full loads of laundry (especially homes with children), which may facilitate nightly uniform cleaning.

Institutional Factors

Participants focused heavily on factors associated with the food service environment and food service jobs. All participants discussed the influence of various workplace demands, including time pressure, high customer volume, understaffing, and strenuous work schedules. Depending on the type of health and hygiene practice discussed, many participants mentioned small workspaces and issues with resources as barriers to

proper practice. Participants asserted that various restaurant policies and procedures supported unsafe practices and that low wages and a lack of access to health insurance and paid sick days strongly influenced decisions to work when sick. In addition to these factors, a couple of participants identified insufficient training as a barrier.

Working conditions: time pressure, high volume, work schedules, and understaffing

Time pressure was expressed by all participants as a barrier. Many informants indicated that food safety contends with an extremely busy and fast-paced environment where workers are “rushed to get things done” and, “you just don’t have the time” to change gloves or wash hands according to procedure. Time pressure was also often related to other factors, such as being short staffed (including from turnover), strenuous work schedules (e.g., long hours, back-to-back shifts), high customer volume, and food service tasks that do not “allot the time” for food safety. For example, many workers expressed how working late, long hours, and back-to-back shifts supported unclean uniforms:

On a Saturday night you probably get out of there at 2:00 or 3:00 in the morning, and then you’re expected to be back at 10:00 the next morning. I just don’t have time to bleach and, you know. You know, it starts out the week perfectly bleached, ironed. Everything’s great. I have a couple of uniforms lined up and waiting. But like by the sixth double, I don’t even have time to do that.

Other participants related high customer volume to problematic hand washing and glove use practice. One participant explained,

Even with not changing our gloves, there are still multiple lines or multiple orders - there are too many people in the store. There’s too many. [Workers will] skip steps to get it done. And cleanliness is probably one of the first ones they skip, probably.

For a number of interviewees, these factors supported behaviors such as working while ill, including coming to work and failing to leave when experiencing illness symptoms. One participant explained that despite feeling sick during her shift, “If they’re busy, they’re not going to send you home; they are going to let you work.” Other participants connected strenuous schedules to prolonging and increased experiences of illness (“When I get sick, it’s hard for me to get over it because I am pushing and pushing and pushing”) and being forced to choose between meeting food safety practices or taking time for basic needs, such as a break to eat, rest, and use the restroom.

To balance time pressure and food safety, a few participants described potentially problematic and high-risk solutions. A couple of interviewees discussed “doubling-up on gloves,” so that they could quickly remove and replace a pair when soiled or torn. Other workers suggested that it was common for workers to keep extra pairs of gloves in their pants and aprons, so that they could still access them and save time.

A few participants noted that these issues were exacerbated by factors such as the location of the restaurant (centrally-located or community restaurant), time of day (lunchtime, post-school or work hours), and day of the week (Friday and Saturday), since these were factors associated with high customer volume. An interviewee who worked in a fast-food restaurant near a high school explained: “It’s always, fast, fast, fast, fast, fast! Unless it’s between school time, or when kids are in school or overnight. But 3 to 11; it’s busy.”

Working conditions: the physical environment and resources

Elements of the physical workspace were considered by some participants to promote unsafe health and hygiene practice. A few participants expressed how unhygienic restaurants, such as dirty workspaces, “grease-caked floors,” and kitchens that did not “meet clean standards,” signaled a lack of restaurant commitment to food safety and discouraged their own hygienic efforts. One cook explained, “If the place is dirty, some people may say then what am I worrying about it for?”

A number of other participants suggested that smaller kitchens and cramped spaces, combined with other factors (e.g., how many people are working and busyness), could reduce the frequency of hand washing and changing of gloves. Conversely, a couple of participants described small kitchens with small staff as conducive to regulating proper food safety practice (“We’re such a small kitchen; you would know if someone was being gross”), and accessibility of sinks and other resources to exercise proper behaviors.

Working conditions: resources

All participants described issues with resources as a factor that impacted health and hygiene behaviors. Improper hand washing practice was related to a lack of soap and drying towels and issues with sinks (limited number, poor functioning, and blocked from use). One participant explained,

A lot of kitchens I have worked in, they will have access to only a couple of sinks, some of them don’t work properly, some of them a lot of times will sit stuff in the sink, or block it with things in the kitchen, like tubs of bread or whatever. They will make the sink completely inaccessible to you.

A number of workers also mentioned that sinks were inconveniently located, a factor perceived to impact hand washing frequency and the effectiveness of the procedure. One cook explained, “If this is my stove, and I have to go out there to wash my hands, it’s going to discourage me because I don’t want to leave my station. My food might burn.” A number of participants identified sinks that were located such that workers had to touch contaminated objects, such as doors, to use them and return to work stations.

Some workers discussed the potential for contamination associated with poor glove quality. Discussing the differences between latex and non-latex gloves, many workers identified the latter as a clear and plastic glove that was “trash bag material,” “loose” and “terrible.” Some participants mentioned that gloves were not available in their size, which meant gloves were sometimes too large and “they came off in food” (a situation described to disproportionately affect female workers) or too small and ripped to expose food to workers’ hands. Due to their awkward fit, many workers also felt that these gloves slowed them down, which encouraged less frequent use. In contrast, latex gloves were described as superior in quality and fit, which made them better for food handling and more likely to be used. Though many workers preferred this option, they mentioned that latex gloves were not readily available since restaurants prefer “less expensive and disposable” options.

A few participants added that gloves were often not easily accessible, such that they were located away from their prep station or other work areas. These workers suggested that as a result, workers “may not wear them or change them as much.” In some cases, gloves were identified as simply unavailable, including “at the end of the month before the

order comes in,” popular sizes that would always “go out very fast,” and restaurants that would “run out and be out for a couple of days.”

Issues with fit, poor quality, and cost were identified as barriers for workers in meeting clean uniform and outer garment requirements. In some cases, workers described supplied outer garments, such as aprons, that were thin, plastic, and prone to ripping. These characteristics were suggested to deter workers from using them regularly. A few other workers mentioned that certain elements of their work uniform, such as a chef jacket, were prohibitively expensive, which precluded them from having enough garments to ensure their cleanliness throughout the work week.

Working conditions: wages and benefits

A number of workers suggested that low pay impacted the ability to stay home when ill. One worker explained, “You can’t afford to take off. You can’t afford the doctor’s fees and all that. People cannot afford that in this industry at all; the food industry does not pay like the corporate industry.” The situation was described to be worse for servers, who “work off tips” and must “give up shifts” and tips to stay home. A few servers also explained that they earned a tipped minimum wage (and not tips) if they had to stay past their shift to complete other tasks. Such low pay encouraged servers to rush or skip hand washing and glove use practices to avoid these situations. One server explained this pay breakdown,

When you are serving [and completing side work], you’ll get minimum wage for a server for that time; you won’t get the minimum wage because you won’t be making tips for that time. It’s like \$3.60 usually, you’ll just get paid that for the extra hour you stay. But not the tips.

Some workers suggested that workers, including managers, were paid to complete certain requirements (“to cook the food, to prepare the food, to stock the food”), but that they were not “paid enough” to also ensure food safety practices. Considering health and hygiene requirements in addition to other job tasks, one participant explained, “You’re not getting paid the amount you should for the things that you have to do.”

Most participants mentioned that, “very rarely do [workers] get benefits,” which impacts their ability to stay home when ill or obtain doctor verification of illness (a requirement for most food workplaces). A number of participants indicated that they lack health insurance through work, and that they have to “worry about healthcare” on their own. In these instances, doctors’ visits were described as unaffordable (“It will cost me a fortune”) and many avoided them—and worked through sickness—for these reasons.

Decisions to access health care to treat or verify illness were also related to paid sick days. Participants mentioned that, in the food industry, this benefit was “unheard of.” In conjunction with lack of access to health insurance, one worker explained, “If you don’t have sick time, and you don’t have insurance, you’re gonna walk into that job halfway dead because you gotta pay the bills.” In a few cases, access to paid sick days was prioritized as an essential benefit determining worker health and hygiene practice. Discussing why workers work sick, and not tell supervisors, one server explained,

If I'm not getting paid sick time, I'm not going to go spending money to go see a doctor. Even though I have insurance, there are still co-pays. And okay, they could write me an antibiotic prescription, so now I've got to go pay for that. And if I'm not – if I don't have any sick leave, I'm not only losing money for not being at work, I'm putting money out of my own pocket.

A few participants mentioned that some workers rely on free clinics and emergency rooms to help meet workplace food safety policies, such as doctor's note requirements.

Formal & informal policies and procedures

A variety of formal and informal policies and procedures were cited as factors that impacted proper health and hygiene practice. Some participants mentioned that a restaurant may lock up resources, such as gloves, towels, and soap, and give specific people access and responsibility for restocking. Participants suggested that these policies may promote proper practice if followed, but that they often left workers without resources and thwarted from obtaining more. One worker explained, "If you have to find a key to unlock a cabinet or something, just to get the soap, then you're going to say to heck with the soap."

Some participants described informal instructions to reduce glove use and save costs as factors that impacted proper glove practices. One participant was told to not "change gloves every single time, but only when they are torn" while another was instructed to "use the [single-use] gloves, then take them off, then put them on the side, then put them back on." Still others were asked to conserve gloves by washing them after use. A few participants qualified these statements by suggesting that such "crazy" policies were less prevalent in larger establishments that had an "endless supply of gloves," which were readily accessible and properly used.

Restaurant policies for uniform distribution, purchase, and cleaning were identified to impact adherence to clean garment requirements. Many participants mentioned that employers provided only a certain number of uniforms, ("You may get two, starting off with two chef coats, two pairs of pants..."), which often did not match the number of

consecutive days that one worked (“...but you need at least 5-7”). In many instances, workers also paid for garments, either up front or out of a paycheck later, and were responsible for their cleaning, and washers and dryers were not accessible through work. Together, these policies increased the costs and effort required of workers to ensure clean uniforms, which some workers described as reducing adherence to this requirement. A few participants described workplaces where uniforms were given in sufficient quantities, and workers had access to free workplace cleaning services. These participants suggested that these factors promoted clean uniforms.

Workplace policies to manage staffing and worker illness, including that a worker cover his or her own shifts and obtain doctor’s notes when sick, were cited as barriers to proper practice. A number of participants indicated that it was frowned upon to report illness on short notice, even though this was often how illness happened. They also described difficulty in getting shifts covered. To manage these situations, participants indicated that they would work sick or be asked to do so. One worker explained,

If you call up an hour before, they will say why didn’t you tell us earlier that you were sick? And then they usually won’t believe you if they say you just got sick. They will tell you to come in, see how you feel, and we will try to send you home early if it’s that bad.

Most participants explained that restaurants require doctor’s notes as proof of illness when workers call out sick or as verification of workers’ convalescence. Though this policy’s purpose is to ensure sick workers are excluded from work, it may actually encourage presenteeism as workers attempt to prove illness without incurring health care costs they cannot afford. One server explained,

So you have to have a doctor's note in order to not come to work. And I think that sometimes leads people to showing up ill because you know, it is \$88 to \$100 to go to a doctor, and if they're just sort of feeling eh, it's maybe not worth it to do that. They'd rather come in and have the manager see that they're ill and then send them home.

Participants understood that workplaces had to protect against absenteeism. At the same time, a few suggested that restaurant penal systems to protect against this problem, such as points and strikes, also encouraged working ill. Participants mentioned receiving points associated with absences and other situations, such as being late and not having a doctor's note. At a certain number of points, workers faced consequences, including losing their job. In response to these systems, participants described pressure to choose their employment over food safety requirements:

You can only get like two or three strikes before they fire you anyway. You better go in there. You go in there dying sick, "Hey, okay. You want me to come in? I'm coming in."

As an exception to penal systems, a couple of interviewees described reward-based systems and other food safety-specific policies that were perceived to facilitate proper practice. These procedures included the ability to accrue "good write-ups" and receive new titles (crew leader) and food safety resources ("they put you in food safety classes"), as well as the use of timers and beep systems to remind workers to pause and wash hands.

Training

A couple of workers suggested that insufficient training may promote unsafe health and hygiene behaviors. One participant defined this issue as instruction that fails to inform workers regarding the reasons for a particular food safety practice. Another participant

suggested that training should do a better job to impress upon workers the importance of “keeping stuff clean.”

Community-Level Factors

A number of participants identified various characteristics of their community as factors that supported unsafe health and hygiene practice. Limited access to affordable and geographically convenient services and businesses, such as health care facilities, clothing stores, and cleaning services, were perceived to impact workers’ ability to meet requirements to not work while ill and to maintain clean work clothes. In order to try and meet these requirements, participants described using free clinics or the emergency room to postpone payment; acquiring extra uniforms at second-hand stores, in out-of-season styles, or through temp agencies; and using friends’ washers and dryers, washing clothes in tubs and sinks, and hanging clothes on a line to dry.

Some workers mentioned limited access to private transportation and a reliance on public transportation as additional barriers to health and hygiene practices. These factors were related to clean clothing requirements through the burden of accessing Laundromats, and doctor’s note and other illness requirements through the time and energy required to get to a hospital or wasted by going home following an extended trip to work.

A few participants suggested that some community-level factors, such as working in food service jobs far from home and other community organizations, were the product of communities that had few opportunities for employment, and even fewer “good jobs.”

Public Policy-Level Factors

Some informants expressed the view that poor national economic conditions, policies regarding reporting-time pay laws and a lack of policies regarding paid sick days, and changes to federal health insurance requirements impacted workers' adherence to proper health and hygiene requirements.

Some participants mentioned that a weak national economy placed pressure on workers to show up and keep up with responsibilities, which including rushing or skipping food safety practices and working when ill. One participant explained,

I definitely feel pressure to go to work unless I'm dying, unless I feel like I can't move, and I can't go ten minutes without puking, I'm gonna go to work. And I think that's probably true for a lot of places, especially now with the economy, you know, any job is a godsend, so people feel like if they lose this job they might not get another one...

A few participants mentioned food safety impacts associated with reporting-time pay (or show-up pay) policies (i.e., laws that establish a minimum payment to workers that present to work when required or requested, where there may end up being little or no work available) (Legal Information Institute, n.d.). These participants, who worked on a shift schedule and were paid hourly, described a guaranteed pay of only two hours, which they indicated then encouraged working whenever possible, including when ill. A few workers also identified a lack of policies regarding paid sick days as an additional barrier to safe practice.

Recent changes to federal health insurance requirements were also suggested to impact worker hours and pay. In discussing the Affordable Care Act Employer Mandate,

which requires that all small businesses (those with 50-99 full-time equivalent employees) provide workers with health insurance, one worker explained:

Everybody at the restaurant where I work is 28 hours or less a week now, because of ObamaCare. [The restaurant] had 90 something employees; they let 30 go before the 31st of last year, doubled up on some shifts, and moved things around. [They] cut just below so they don't have to offer anything.

Participants suggested that as a result of these changes, and employers' response, workers must work regardless of whether or not they are sick.

5.5. Discussion

In this study, I analyzed food worker perceptions of factors that influence workers as a common source of foodborne outbreaks in restaurants. In response to scenarios about worker deviations from health and hygiene requirements, participants identified a variety of factors, across the five levels of the social ecological framework, that were perceived to impact proper practice. These findings are consistent with previous research that identifies an important role for factors beyond food safety knowledge and training in shaping food workers' ability to handle food safely (Carpenter et al., 2013; D. A. Clayton et al., 2002; L. Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007).

Using a qualitative approach that prioritized food workers' perceptions, however, additional influences were revealed, many of which emphasized workers' social and structural context in shaping proper health and improper hygiene practice. These additional factors related to the workers' personal resources, food service positions and work environments, family and friend networks, and issues related to workers' communities and policy context. For example, at the individual level, in addition to workers' knowledge,

attitudes, and beliefs, limited financial and hygiene-related resources, such as a low income and no personal washer and dryer, were perceived to complicate workers' ability to ensure clean uniforms and not work when ill. Outside of work, participants connected their ability to ensure safe food to relationships with family and friends, including workers' responsibilities to care for spouses and children. Specifically, participants found poor working conditions, such as low wages and a lack of benefits like paid sick days, challenged their ability to provide for families and encouraged many to work while ill.

In line with previous research, participants also described a role for relationships with co-workers and management (L. Green & Selman, 2005). Adding to our understanding of these social factors, however, participants emphasized that managers' leadership style, including an ability to make workers feel seen by their employer and valued as a member of a team, served as an essential motivators of proper practice. In many cases, participants felt these relationships were achieved by managers who modeled proper food safety practices and made time to listen to and engage with workers, and by food service establishments that provided good working conditions, including decent pay, access to benefits, preferred schedules, and clean working environments.

These individual and interpersonal factors were interrelated with factors related to food service jobs. These job-related barriers included formal and policies for resources (e.g., uniform distribution, purchase, and cleaning), worker absenteeism and illness (e.g., points systems and doctor's note requirements), and staffing, which participants associated with strenuous work schedules that prolonged sickness. As previously mentioned, and as factors that were highly interrelated with other barriers to proper practice, participants also

emphasized the food safety impacts of wages and benefits, including a lack of access to paid sick days and health insurance. These factors were described as especially prohibitive in relation to meeting requirements to stay home when ill. This finding contrasts with limited previous research that identifies a role for workers' concerns about pay, yet suggests that this factor may not be a primary source of influence in decisions about working sick (Carpenter et al., 2013).

At the community level, participants described barriers to proper practice through a lack of good jobs, long distances to work, and issues with transportation as well as health and hygiene-related services, such as primary care, clothing stores, and cleaning services. Beyond the community, some participants revealed additional structural barriers to food safety within the policy environment. These barriers related broadly to poor economic conditions while also accounting for state and federal laws for reporting-time pay, benefits, and health insurance. While previous food worker research does not account for workers' community or political milieu as related to safe food, my findings suggest that these contexts shape workers' ability to ensure food safety and should be considered by food safety strategies in the service sector.

In some cases, identified factors were perceived to impact certain health and hygiene requirements more than others. For example, workplace policies, procedures, and issues with pay and lack of access to benefits were most commonly described as barriers to ensuring clean uniforms and requirements to not work when ill. In contrast, barriers such as time pressure, high customer volume, design of the physical environment, and issues with resources were largely related to improper hand washing and glove use. Barriers to

proper practice also seemed to differ by the type of restaurant (e.g., fine dining vs. fast food), the food service position held (e.g., server vs. cook), and the establishment size (e.g., large vs. small facility and staff size). These factors suggest that interventions to promote proper practice should consider the unique needs and characteristics of different food service establishments and positions. Involving workers in the development of these interventions may allow for these nuances to be more effectively identified and considered within facility food safety plans.

According to social ecological theory, food safety interventions will be most effective if they account for the range of factors that impact workers' health and hygiene practice. Study findings reveal that workers identify factors on each level of the social ecological model in how they conceptualize the relationship between food workers and food safety. Complementing a current industry focus on food safety knowledge and training, then, I recommend a series of additional interventions to more comprehensively promote food service workers' ability to ensure safe food. For proper handwashing and glove use practice, food facilities should develop strategies to prevent understaffing (including through hiring additional staff to fill in during busy customer hours) and stock sufficient quantities of glove types (latex and single use) and sizes. Food facilities should also order gloves to reflect the composition and preferences of staff, such as smaller sizes for some women or enough latex for all workers who prefer the grip. Food facilities should also use soap that is less harsh and abrasive on workers' hands, especially after repeated use.

To promote clean uniform requirements, food service staff should have regular on-the-job access to washers and dryers and/or have access to a free workplace cleaning service. Food service facilities should complement these resources with uniform distribution policies that provide at least as many uniforms (all components – pants, shirts, jackets, etc.) as the number of days that staff work in a week. Extra uniforms should also be available, in a range of sizes, to support cleanliness amid demanding schedules where workers may not have the ability to clean garments before returning to work. Finally, to support requirements to not work when ill and that workers report illness to a supervisor, food facilities should provide affordable health insurance and paid sick days as well as higher pay. Food facilities should also change staffing policies so that workers do not face pressure to find their replacement when out sick.

Strategies that may support the range of workers' health and hygiene requirements include replacing penal-based systems (e.g., strikes and points) with reward-based systems, where workers are positively reinforced for proper food safety practice (including through new job titles and resources like advanced health/safety training). Manager training should emphasize the importance of including workers in food safety planning and implementation, showing care and respect for staff (including through meetings that welcome worker participation and input), and in working alongside workers to achieve food safety procedures, especially during periods of high customer volume and not only when health and safety inspectors are present. To reflect a food safety priority, the food service facility should be clean. Management should also reflect and maintain food safety standards through proper food safety practice, reminders, and enforcement. Finally, development and implementation of food safety interventions should be conducted with

input from worker health and safety regulators. These stakeholders should work together to ensure that standards to protect food do not inadvertently put workers at risk, including glove requirements that protect against contamination but also impact workers' ability to handle knives safely.

Altogether, these findings expand our understanding of the range and complex interplay among multi-level factors that influence food workers' food safety practice. Future research is needed, however, to clarify these interactions across restaurant types and food work positions and to identify which of these interactions may be most important for the control of foodborne outbreaks (Sallis et al., 2008). Further, this study has some limitations. First, findings are limited to English-speaking food service workers who have access to and utilize Craigslist. This recruitment strategy restricts participants to those who have access to and utilize the Internet and who have a phone or email to respond to postings (Worthen, 2013). Further, the study relies on self-reported data on a potentially sensitive topic, which may have encouraged participants to share what they believed were socially-desirable perceptions. However, the study design employed a variety of behavioral science techniques to limit these issues and enhance the validity of these data, which represents a strength over previous work (L. R. Green, 2008).

5.6.Conclusion

Using in-depth interviews with food service workers in Baltimore, Maryland, this study prioritized worker perceptions of barriers to proper food safety practice. The findings broaden the scope of factors identified as barriers to proper practice, and highlight the role of food workers' social and structural context in shaping proper health and hygiene

behavior. By using a social ecological approach, barriers were accounted for in relation to more commonly identified influences, such as those related to worker characteristics and the food work environment (including time pressure, understaffing, high customer volume, and issues with facilities and resources). In combination with this model, the use of a qualitative, in-depth approach also made apparent the complex interaction among factors at different levels, and revealed the value in an ecological orientation in understanding food workers' health and hygiene behavior. The results from this study may be used to guide the development of more comprehensive food safety programs in restaurants, as well as to better support food workers in ensuring food safety.

CHAPTER 6. MANUSCRIPT 3 – Poor Food Working Conditions as an Issue of Food Safety: Key Stakeholder Perspectives

6.1 Abstract

Food workers are identified as a common source of foodborne outbreaks in the United States. Improving food working conditions is an important strategy to improve food safety and public health because working conditions impact workers' health, hygiene, and overall ability to ensure safe food. Interest groups represent one possible source of needed efforts to achieve this goal and stakeholders in other industries, such as health care and transportation, have been successful in institutionalizing working conditions as an issue of public safety in the U.S. Yet despite the relevance of this link for the food industry, stakeholder engagement with this topic is seemingly limited. To help understand this lack of action, I conducted 10 interviews with key stakeholders recognized for their agenda-setting role on food worker issues. Findings suggest that participants recognize the connection between work standards and food safety, yet a number of perceived barriers limit adoption of a food safety frame, including the notion that there are more pressing issues for food workers and work, a lack of fit with organizational strategies and mission, and questionable frame utility, including the potential for negative consequences. Based on these findings, and in relation to theory on the policy process, I consider how public health advocates may proceed in connecting working conditions to food and public safety in the food industry and on the public policy agenda. Increasing coordinated action among diverse stakeholders focused on public health, food work, and food safety may be a promising approach.

6.2 Introduction

A connection between poor food working conditions and food safety was first documented in Upton Sinclair's 1906 novel *The Jungle*. Through detailed accounts of the lives of immigrant workers in Chicago Stockyards and meatpacking companies, Sinclair wrote of an inseparable link between unsanitary food production and work that included wage theft, high-risk activity, low pay, and the absence of social benefits. The novel was well-received by the public, though to Sinclair's dismay, the response focused on descriptions of filthy and diseased meat rather than the experiences of workers (Spiegel, 2003). According to social historian James Harvey Young (1989), these events ended three decades of Congressional debate regarding regulation of the U.S. food supply as President Theodore Roosevelt, angered by the novel, signed the 1906 Pure Food and Drug Act (PFDA) and Meat Inspection Act (MIA) into law. This legislation marked the beginning of federal regulation of food and drugs in the United States (Johnson, 2014; Young, 1989). Sinclair would consider the fact that these changes did not also address the hardships of food workers to be a shortcoming of his work ("I aimed at the public's heart, and by accident I hit it in the stomach") (Spiegel, 2003).

Over one hundred years later, foodborne disease represents a significant public health problem in the United States (Centers for Disease Control and Prevention, 2012). Though a variety of factors have been identified to cause foodborne outbreaks, one of the most common is food workers, who contaminate food through poor health and improper hygiene practice (Carpenter et al., 2013; Todd, Greig, Bartleson, & Michaels, 2007a; U.S. Food and Drug Administration, 2000). A number of food safety studies have focused on these issues in relation to workers' food safety knowledge and skills, and recommend that

food handlers receive training to help prevent contamination (Hedberg et al., 2006). As progress in addressing foodborne disease has remained stagnant, however, some studies have increasingly looked beyond workers to consider poor food working conditions, such as strenuous work environments, various workplace policies, and issues with resources, as factors that also impact workers' health, hygiene behaviors, and overall ability to ensure safe food (Carpenter et al., 2013; D. A. Clayton et al., 2002; L. Green & Selman, 2005).

Despite growing recognition that poor food working conditions shape food safety, however, food jobs remain some of the worst jobs in the U.S. Though some food positions afford a livable wage and upward mobility, the vast majority are front-line positions (typified by repetitive tasks, little decision making, and a lack of workplace power) and include low wages, little access to benefits, few opportunities for advancement, and significant risks to worker health and safety (Food Chain Workers Alliance, 2012). In a 2012 survey of workers across the food system, 79% reported that they lack, or do not know if they have access to paid sick days, 83% reported a lack of health insurance from employers, and 58% lacked any coverage whatsoever (Food Chain Workers Alliance, 2012). Beyond these conditions, many food workers cite that the inconsistent provision of wages and work hours challenges their ability to plan and achieve economic stability. It is therefore sadly unsurprising that food workers and their families also experience high rates of food insecurity and, to support themselves, participate in public assistance programs at twice the rate of all U.S. workers (Food Chain Workers Alliance, 2012; Restaurant Opportunities Center of New York, 2014).

Altogether, these data show that at some level the working conditions of most concern to Upton Sinclair are still poor and problematic for worker and food safety. The separation of food labor from food production that followed the book's publication has continued today, and poor food working conditions as an issue of food safety still evades the public policy agenda (Spiegel, 2003). Thus, an important step to improve food safety and public health is to identify opportunities to reconnect these issues and to place them at the forefront of public and government attention.

Agenda-setting in health care and transportation industries

To explore opportunities to connect food work to food safety, we may consider U.S. industries where the role of working conditions in public safety is well established. The health care industry is one example where health professionals' working conditions are recognized to influence the likelihood of errors and the quality of patient care, including factors such as staffing levels, work hours, the physical environment, and organizational culture (R. G. Hughes & Clancy, 2005; Landrigan et al., 2004; Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002; Rogers, Hwang, Scott, Aiken, & Dinges, 2004; Stone, Du, & Gershon, 2007). While more work is needed to implement improved standards, the link between health professionals' working conditions and public safety is recognized, including within certain state and national policies such as California's minimum nursing staffing legislation and resident physician hour and shift requirements under the Accreditation Council for Graduate Medical Education (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Volpp & Landrigan, 2008).

Research on the health care industry has related this success to the models set by the U.S. transportation sector, where hours of service regulations, for the purpose of trucker and public safety, have existed since the 1930s (Jensen & Dahl, 2009). Historical accounts of these regulations draw parallels between the two industries and highlight a central role for special interest groups (e.g., advocacy groups focused on consumer protection), worker advocate, and labor organizations, in building momentum for and shaping legislative change (Heaton, 2005). These data are supported by agenda-setting research, which defines interest groups as key policy actors whose interests and power may impact policy (Brugha & Varvasovszky, 2000).

According to theory on the stages of the policy cycle, agenda-setting may be understood as putting a problem on the agenda to be seriously considered for public action. To arrive at this stage, however, policy actors, such as worker advocate centers and unions, must first recognize that there is a policy problem, which requires that a social problem and need for government intervention have been defined and expressed (Jann & Wegrich, 2007). Policy actors also face a diverse range of problems to choose from and have finite time and resources to act. As a result, agenda-setting also involves issue selection, or that stakeholders identify a set of issues and the interpretation or construction of those issues for their own agenda and thus promotion in public policy (Birkland, 2007). Based on these theoretical perspectives and examples from other industries, advancing poor food working conditions as an issue of food safety requires, first, that we understand the current state of key stakeholder engagement with the food safety issue, including potential opportunities and challenges surrounding issue recognition and selection.

Key stakeholders on poor food working conditions as an issue of food safety

Identifying key stakeholders for the issue of food work and food safety requires consideration for the interest group landscape in the food industry. In recent years, food worker advocate centers (defined by Fine, 2006, as community-based mediating institutions that support and organize low-wage workers), labor unions, and related groups have increasingly come together to impact change in the food system at local, state, and national levels (J. Fine, 2011). Despite variation in specific goals and activities, these worker-based organizations share a purpose of improving food working conditions in the U.S. (J. Fine, 2006). Through collaboration—including participation in national coalitions such as The Food Chain Workers Alliance (FCWA)—these stakeholders have realized an opportunity to increase power and influence by connecting work strategies, experience, campaign work, and members into a network that represents and supports workers across the food chain (including production, processing, distribution, retail, and service sectors) (Food Chain Workers Alliance, n.d.; Livengood, 2013; Tattersall, 2010).

Worker advocate centers and their networks have been credited with putting labor standard enforcement in low-wage, immigrant-heavy industries back on state and national public policy agendas (J. Fine, 2011). Strategies to accomplish this work are varied and include engaging in campaigns, drafting reports, writing legislation and contracts, engaging with elected officials, organizing strikes and marches, and performing wide dissemination of workers' stories among policymakers and the public (J. Fine, 2006; Hyde, 2006). While not all of these initiatives have met with success, collaborations among worker advocate centers and unions have contributed to the development of new state and local ordinances as well as the drafting of stronger federal labor standards, such

as the Wage Theft Prevention Act (Bobo, 2009; J. Fine, 2011). In the last 5 years, the FCWA and participating groups such as the Restaurant Opportunities Center of New York (ROC-NY) have launched a number of successfully campaigns against food employers engaged in poor labor practices, including discrimination and wage theft. These campaigns have won back wages, worker promotions, new promotions policies, and compensation for past employer retaliation, as well as achieved stronger agreements to protect workplace rights (Food Chain Workers Alliance, 2012).

Though much work to improve food working conditions remains, some researchers anticipate that these stakeholders, through their continued growth and partnership, represent an important opportunity for renewed visibility and policy change for better labor conditions among low-wage workers in the U.S. (J. Fine, 2011; Hyde, 2006; Tattersall, 2010). Specifically within the food industry, and guided by agenda-setting theory and the historical development of these issues in the health care and transportation sectors, these groups may also represent key actors for mobilizing policy around poor food working conditions as an issue of food and public safety. Despite this advocacy potential, however, and the appearance of relevance and opportunity in a food safety frame, these stakeholders' engagement with this issue is seemingly limited and has yet to be explored.

To shed light on this conundrum, this study aims to identify key stakeholder perspectives on engaging with poor working conditions as an issue of food and public safety. The findings from this research may help public health advocates to develop strategic starting points and initiatives to advance these issues within the food industry and on the public policy agenda.

6.3 Methods

To explore the question of food industry stakeholder perspectives on engaging poor food working conditions as an issue of food safety, I conducted 10 key informant interviews.

Study participants were identified from a purposive sample of stakeholder organizations (worker advocate centers, labor unions, and related groups) focused on issues related to food workers, food working conditions, and/or food safety. Eligible groups were also geographically diverse and highly engaged in collaborative work to impact change across the food system, including in the food production, processing distribution, retail, and service sectors. To help develop the study sample, I sought input from national alliance network leadership, who provided feedback on a list of pre-identified groups and made recommendations to assure that the sample may best inform study aims and meet inclusion criteria.

Within stakeholder organizations, eligible participants were English-speaking adults who had been active in the organization for an extended period of time, held a leadership position, and were informed about their organizational mission, work strategies, and the challenges faced by the food worker population served. The purpose of these criteria was to increase the likelihood that participants could provide rich information about stakeholder engagement on issues related to food working conditions and food safety and the perceived opportunities and challenges for advancing these issues on the public policy agenda (Curtis et al., 2000).

Recruitment and data collection

I used contact information from personal contacts, public websites, and organizational reports to contact representatives from select stakeholder groups by email. Potential participants were sent a recruitment letter including a brief overview of the study and participant eligibility criteria. I contacted 14 stakeholder organizations and received 10 expressions of interest (2 stakeholder groups did not respond and two responded with interest but indicated a lack of time and personnel to participate). This sample size is appropriate given the focused scope of the study, the clear nature of the research topic, and the high level of experience and depth of information available from study participants (Morse, 2000).

I conducted in-depth semi-structured interviews with those who expressed interest. Each interview lasted approximately 40 minutes. The interviews were conducted between December 2013 and April 2014, and occurred by phone at participants' convenience. The interview guide included general questions about stakeholders' history, mission, and activities (including strategies for advancing organizational priorities), the type of food workers and food system sectors supported, whether and why stakeholders may engage issues of poor food working conditions in relation to food safety, and stakeholder perceptions about opportunities and barriers for advancing this issue on the public policy agenda.

Interviews were audio-recorded and transcribed. All participants provided informed oral consent as part of the study protocol approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Coding and analysis

Each transcript was read in its entirety to get a sense of the data as a whole. Each transcript was then re-read and I completed a brief summary of initial reactions and any broad analytic categories or topics that emerged from the data. Following seven interviews, I recognized repetition among stakeholder responses, which signaled that no new information was emerging from study transcripts. The three additional interviews conducted as a part of the sample further supported this assessment. The broad categories identified during this analysis process were consolidated into major themes and developed into an initial coding framework organized by study aims, including themes related to food safety engagement, challenges or barriers to action, and opportunities to advance the issue on the public policy agenda. Before applying the framework to all transcripts, I engaged in peer-debriefing with my thesis committee, which helped to question my assumptions and to develop observations associated with identified themes and coding categories (Shenton, 2004). The framework was adjusted based on input and then applied to all transcripts using ATLAS.ti 7.1.8 qualitative data analysis and research software (Muhr, 2014).

To help ensure trustworthiness in the study, exemplary quotes were identified to ground results in examples provided by stakeholders and to clarify my interpretation and understanding of these data. To protect the confidentiality of participants, data were de-identified in results and reported across the entire stakeholder sample.

6.4 Results

The final sample consisted of 10 stakeholder organizations and included worker advocate centers (n=4), labor unions (n=3), and other groups (n= 3), including a legal

center, worker training academy, and business/organization partnership. Stakeholders represented food workers across the five main sectors of the food system, including production (n=3), processing (n=4), distribution (n=1), retail (n=2) and service (n=3) sectors, at a variety of levels, including national (n=2), regional (n=2), and local (n=6) levels. Participating organizations were also geographically diverse, and were located in the West (n=2), Northeast (n=3), Midwest (n=1), and South (n=2) U.S. regions; the two remaining organizations identified their location as national (**Table 6**). All participants held leadership positions in their organizations, including titles of director, executive director, project director, health and safety director, lead coordinator, leader, and lead organizer.

Table 6. Characteristics of Stakeholder Participants	
<i>Characteristic</i>	<i>Number</i>
Organizational Structure	
Worker Advocate Center	4
Union	3
Other (e.g., legal group)	3
Level Organized	
National	2
Regional	2
Local	6
Food Sector Represented*	
Production	3
Processing	4
Distribution	1
Retail	2
Service	3
Geographic Distribution	
West	2
Northeast	3
Midwest	1
South	2
National	2
*Numbers do not equal 10 because characteristic not mutually exclusive	

Stakeholder missions and strategies

The majority of participants identified their main mission as improving wages and working conditions for food workers. For the remaining participants, this mission also included other foci (e.g., reducing poverty, addressing environmental issues, and improving food safety), and groups (e.g., manufacturing and health care workers, immigrants, various minority groups, and food industry employers).

Almost all participants accomplished this work by organizing workers, including through negotiating bargaining agreements, strikes and marches, and popular education, media, and social activities (e.g., theater, community radio, and movie nights). A few participants also organized employers, including through roundtable meetings to share best practices and to brainstorm about issues in the workplace. As respondent 1 explained,

...there are employers that are offering paid sick days to everybody on their staff—front of the house, back of the house, full-time, part-time—there are employers that are doing good by their workers and so [this prong of our work] is how we try to find those employers and the same way we organize workers we try to organize employers.

To enhance workers' power in the workplace, most groups provided workforce development programs (e.g., building skills for higher-wage positions and career preparation, including how to apply, dress, and interview for jobs), services (e.g., assistance “dealing with contracts” and confidential compliant hotlines) and education (e.g., English and nutrition classes, and worker rights training). Beyond these strategies, a number of participants also engaged in participatory research, policy-based advocacy, and litigation, including testifying in front of local councils and campaigning for wage and benefits requirements. In a few instances, stakeholders created entirely new organizations,

structures, and workplace monitoring programs for setting new and enforcing current labor standards.

Across stakeholder groups, participants emphasized that their strategies were worker-led or developed through significant engagement with workers and worker communities. Almost all participants conducted their work in partnership, including collaboration with academics and universities, businesses or employers, and other related organizations. As respondent 2 from a worker training center explained, “We partner with a lot of our local—not only unions; different unions—but we also partner with a lot of different labor organizations and civil groups as well.”

Limited food safety engagement and barriers to action

All participants indicated that they recognized a connection between poor food working conditions and food safety. In most cases, participants understood this relationship in study terms, or the impact of work on health, hygiene, and workers’ overall ability to handle food safely. In a few cases, participants revealed that they interpreted the issue differently, and discussed their engagement by providing workers with food safety training or protecting workers from contaminated food. Not including these participants, only a few stakeholders identified purposeful adoption of a food safety lens as defined by this study. These participants explained that the issue was “mutually reinforcing” with other core components of organizational work.

Most participants, however, explained that they were interested in this perspective, but did not engage with the issue (“We do not frame our cause around food safety”).

Across all participants—engaged and not engaged on the issue—barriers to action were

identified. These perceptions are organized according to three main themes: (1) more pressing needs and issues for food workers and work, (2) a lack of fit with organizational strategies and mission and, (3) questionable utility of a food safety frame (including the potential for negative consequences).

More pressing needs and issues for food workers & work

In some cases, stakeholders suggested a lack of food safety engagement resulted from a need to manage more pressing issues faced by food worker populations. For example, one participant suggested that due to changes in the food industry, such as increased consumer demand for fresh foods, many workers in the processing and specifically canning industries were struggling to maintain employment. Engaging with food safety, therefore, had to be secondary to ensuring that these workers had jobs. Respondent 3, who represented a union, echoed this sentiment in relation to the dangers of food work and the need to first protect workers' health and safety: "The food safety issue is a good one, but we're just keeping workers from being killed."

In addition to challenges associated with worker safety and employment, the majority of participants suggested that talking about food safety is thwarted by the fact that food workers are a vulnerable and disempowered population. For example, in addition to poor working conditions across sectors, participants discussed challenges associated with immigration status (e.g., "95% of the workers that we engage with are undocumented"), poor economic conditions and unemployment, and that "low-wage workers, across the board, regardless of race or ethnicity, tend to not be very highly valued, and are thought to be quite replaceable." Because of these vulnerabilities, and "respect and treatment issues,"

many participants suggested that food workers are taken advantage of and feel unable to speak up about poor food working conditions, let alone the impact on food safety.

Respondent 4 characterized the issue as “a climate of fear,” and explained these issues as experienced by processing workers:

A lot of people are in jobs where, if they lose that job, they don't have alternative employment, so people feel like they can't leave their job, and employers take advantage of that and make very implicit and explicit threats that any effort to improve conditions or enforce legal rights will be met with retaliation; people will lose their jobs.

Both related to and further complicating these issues, some participants added that many food workers lack the legal protection necessary to advance a food safety perspective.

Respondent 5 from a worker advocate center explained:

Under labor law, workers can speak publicly, generally speaking, about their working conditions, and that's considered a protected speech. But workers are not protected in terms of their jobs to criticize the employers, their employer's products...

These challenges were especially salient given that most stakeholders accomplished much of their work through worker-led initiatives. For these participants, advancing any issue in the food industry also required “building [workers] up to feel worthy”—a process that was described to take years.

Lack of fit with organizational strategies and mission

For a few stakeholders, organizational strategies were not considered conducive for addressing poor working conditions as an issue of food safety. Respondent 4, who represented an organization that worked primarily in relation to the law, explained,

For a lot of these issues, we try to use litigation, but that's most effective for things like discrimination, sexual harassment, or minimum wage violations. Litigation, for better or worse, is harder to use as a tool to improve health and safety issues.

For a number of other participants, who conducted the majority of their organizational work through campaigns and public education, the food safety message was described as too complex. Using an example of recent work to develop this perspective, Respondent 1, who represented a worker advocate center, explained the difficulty of succinctly and effectively translating these issues while also supporting food workers:

...the biggest trouble that we had was what is the quick way of saying that workers are coming into work sick, they can very easily spread diseases when they are showing up to work sick, but at the same time not demonizing workers for showing up sick and passing on diseases? It's like this weird tight rope that you have to walk and then you continue that sentence by saying tipped workers are making [around \$2.13] an hour, they rely on tips to pay rent, child care, to live, they have to show up for work even when they're sick because they cannot afford to take a day off. But in so many campaigns you want that short and sweet slogan, and it's a two-sentence issue at least.

In addition to a lack of fit with organizational strategies, a few stakeholders suggested that a food safety perspective detracted from a mission centered on workers (“...it basically takes away the human element in the labor force”), labor and human rights, and the development of a “consciousness about [poor working conditions]” in the food industry. As Respondent 6 from a worker organization explained,

We haven't really addressed it purely as a food safety issue, I think, because we don't want to necessarily give up on regulators and petition makers and the public caring about what happens to workers, but there are definitely connections.

For these participants, food safety was identified as important, but it could not be “the center of conversation” in their organizational work.

Questionable utility and negative consequences of a food safety frame

Some participants were divided on the utility of using a food safety frame. For a few groups, food safety was described as a less powerful angle for change than discussing poor working conditions in terms of human rights or social justice. Respondent 7, however, who represented an organization that used a food safety perspective, contested this idea and suggested that food safety was a key priority for the food industry, and thus a critical opportunity for incentivizing employers to “move resources back through the value chain to improve wages and working conditions.”

Other participants echoed concerns about engaging with food safety, however, and suggested that without extensive thought and care in messaging, stakeholders may create “the worst outcome” where “workers become the target, or the idea that it is somehow the workers’ fault.” While a few participants conceded this point, they asserted that the pushback should not create concern, especially since it does not differ from “the pushback that you already get when you are talking around raising wages” and other issues to improve food working conditions.

Opportunities for future food work/food safety engagement

Despite an overall lack of engagement with food safety, participants considered how these barriers may be overcome in future organizational initiatives. Their recommendations clustered around three main opportunities: (1) building the food safety frame through stakeholder engagement, (2) developing worker power and protection at multiple levels, and (3) strategic venues for advancing food work/food safety initiatives.

Building the food safety frame through stakeholder engagement

Many participants agreed on the importance of engaging food safety issues in partnership with a range of stakeholders. In addition to food workers, relevant groups were described as the food industry (management and employers across sectors), the academic community, public health professionals, and other related organizations, such as groups engaged in labor issues, food justice, and food safety. These participants suggested that partnership not only provided access to resources to build a policy agenda, such as data and funding, but also created an opportunity to learn about others' interests, "make all of the connections among all of [the issues]," and develop more effective communication and framing for these public health issues.

For example, Respondent 7 suggested that by including food employers, organizations may create frames of "mutual benefit between labor and management," such as how food workers, through better working conditions, could be "new solutions for food safety" (an issue of primary interest to the food industry). Respondent 1 added that involving workers and "[having them] tell their stories," may engage the public while bypassing jargon and issue complexity. In relation to traditional campaign slogans, this participant explained,

So I think by the end of it we got pretty good at especially those personal narratives where people explain all of the outside influences that brought them to work that day. And also how that really affected them either to have to go into work or if they had to miss an extended period of work and that caused financial hardship. So the slogans were a lot harder and the personal narratives were a lot easier. Because people are people, right? They have that whole range of personal experience and they can really speak on it and really develop it out into a real story.

In addition to humanizing the issue, Respondent 5 added that workers' personal narratives may further bolster them against the potential of negative consequences by revealing that they "are upset and concerned about the situation too" and that "they want to be able to serve safe food."

Developing worker power and protection at multiple levels

To adopt a food safety lens within worker-led models, most participants described a need for stronger worker protection at multiple levels, including improved policies to protect workers from retaliation, policies that defined poor working conditions in relation to workers' health and safety, changes in work reporting structures and committees, and greater worker access to training and skills-building. As examples of these activities, Respondent 5 described "explicitly opening up space for people to talk publicly and to report things that they're seeing" through stronger whistleblower language in worker contracts and reporting committees "formed with workers and management." Other participants focused on connecting these issues within state labor laws. Respondent 8 explained,

So last year we passed a law that...broadly defines health and safety to include that I am not being paid overtime, which makes the argument that, you know, if I'm not being paid the wages that I'm due, then that is a health and safety issue. If a worker is not given the minimum wage, they cannot feed themselves, and that is a health and safety issue.

Some participants added that while worker protections from retaliation do exist, they are "very difficult for a worker to use as a practical matter," including year-long delays between firing and initiation of the legal process to be reinstated. To support worker-led

engagement in food safety, participants recommended new worker protections that allow for “people to get their jobs back quickly.”

Strategic venues for advancing food work/food safety initiatives

In building a multi-level approach to engaging a food safety perspective, participants suggested a number of advantageous starting points, or recommendations for how and where public health advocates may pilot and develop this work. A few participants focused on starting in food sectors where the issue may be most obvious and visible, such as retail and service. Respondent 10 explained,

Obviously when we are in restaurants, some of it is visible to consumers, that connection. If the worker is sick, you can see it. But, you know, most food workers are completely invisible to us. And so who is going to the bakery when they are sick, who is going to the fish processing plant, who is packaging oranges and lemons, we don't know, and in fact we don't see them.

Other participants recommended engaging with issue-progressive groups. These stakeholders were defined as sympathetic populations (e.g., “students, people of faith, and sustainable food supporters”), more agile structures for policies and programs (e.g., state and local government, and independent third-party labor standard programs), and receptive leaders and locations (e.g., public health-oriented areas and leadership). For example, highlighting one such leader in Oakland, California, Respondent 8 explained,

We have someone here in [our] county, where I live, who was a public health director and ... while he was the director of the County Public Health Department, he was one of these guys who was making arguments about raising wages and collective bargaining as good for the public health.

By employing these strategies, participants agreed that a dialogue around poor food working conditions as an issue of food safety may be accessible to worker advocate

centers, unions, and related organizations, as well as to the broader public.

6.5 Discussion

In this study, I examined the problem of poor food working conditions for food safety from the perspective of stakeholders who may advance this issue on the national policy agenda. All stakeholders appreciated the connection between food work and safety, yet only a few actually engaged this perspective in their work. Even though framing poor working conditions in terms of public safety has been a valuable strategy for advancing work standards by interest groups in other industries, including health care and transportation, study participants identified key barriers that were perceived to currently limit this opportunity among food workers and in the food industry.

According to theory on the policy process, prior to advancing an issue on the public policy agenda, stakeholders must first recognize, define, and select a given issue to be elevated in their own institutional work (Birkland, 2007; Jann & Wegrich, 2007). My results show, however, that these pre-conditions to agenda setting are not met with regard to key food industry stakeholders and the food safety frame. For example, even though participants recognized the impact of poor working conditions on food safety as a problem, the majority did not include the issue as a part of the social problems that they defined and expressed as critical for government intervention. I also found that rather than perceiving the food safety issue to be complementary to current work, some participants perceived this problem definition to compete with alternative and more persuasive frames, such as poor working conditions as issues of social justice or human rights. To advance the food

safety issue among key stakeholders, research that draws clearer connections among issues of social inequality and workers' health and hygiene in the food industry may be useful.

Study results also reveal that participants select other issues for institutional agendas that are considered to be more pressing and demanding of organizational and government attention, such as unemployment in the processing sector and risks to workers' health and safety generally. Given that most stakeholders' initiatives were worker-led, participants further described a need for stronger protections for food workers to speak up about their conditions in the workplace. These findings suggest that to effectively advance the food safety issue *through worker-based* organizations, broader and more fundamental policy problems faced by food workers must also be addressed. To help address this challenge, public health advocates should play a leading role in developing public and policymaker awareness for the connections among food working conditions, food contamination, and the impacts for public health.

Apart from competing policy problems and problem definitions, results show that the stakeholders in the food industry find the food and public safety frame to be complex and hard to define. For example, most participants were challenged to clearly relay the relationships among poor working conditions, workers' health and hygiene practice, food contamination, and impacts for public health. Further complicating this communication was stakeholders' use of strategies, such as campaigns, that demanded messages to be succinct and clear. In some cases, these challenges were perceived to vary by food system sector, such that the connection between work and food safety may be more salient in food service and retail, but perhaps less obvious for less visible food workers, such as those in

food production and processing. Across sectors, however, the chain of events connecting food work to public safety was generally perceived to be convoluted and lengthy, which may contrast with the more direct relationship afforded to these issues in the health care and transportation sectors.

As a consequence of these factors, some participants suggested that stakeholders may steer clear of a food safety angle altogether, particularly for fear of misrepresenting the issue and potentially threatening workers' employment while adding to a climate of worker blame. Altogether, these findings suggest that stakeholder engagement with a food safety frame is shaped not only by these groups' selection of alternative problems and problem frames for action, but also by a number of unique factors associated with food work, stakeholder strategies, and the food industry itself. Accordingly, the lessons of action from similar groups in other industries, such as advocacy by public health nurses in the health care sector, may serve as a starting point but not complete model for understanding and advancing this work in the food industry and through food worker unions, advocate centers, and related organizations (Heaton, 2005).

To overcome identified barriers to action, findings reveal a number of strategies to re-construct the food safety issue to be more accessible to key stakeholders, policymakers, and the public. For example, participants asserted that collaboration among diverse stakeholders (including employers, food safety groups, and the public health community) may lead to clearer, more comprehensive issue communication, while also allowing for new framing that better aligns with organizational strategies and a range of key stakeholders' interests (e.g., food workers, through stronger labor standards, as a food

safety solution for businesses). At the same time, these collaborations may also bring new resources that allow participants to expand their own carrying capacity for alternative policy issues and definitions, such as including the food safety issue in their work (Birkland, 2007).

Participants also defined particular groups and venues for pushing this alternative policy problem, including among specific food sectors, members of the public and government, and geographic regions. These strategies are supported by policy process research that describes these venue-shopping tactics as important for opening doors among otherwise excluded groups and achieving the best prospects for achieving policy goals (Birkland, 2007; Pralle, 2003).

Finally, the few participants that had reported using a food safety frame suggested that these strategies were central to the growth and success of their own initiatives. Studies to evaluate these programs and the food safety impacts of improved food working conditions represent vital opportunities to raise awareness of these relationships, both in the food industry and among the public. The food safety frames adopted by these programs may help other non-engaged, yet interested stakeholders identify how a food safety approach may fit with and add value to their own work. Altogether, study findings help to clarify where and how public health advocates may begin to collaborate with key stakeholders to more effectively prioritize, define, and advance poor working conditions as an issue of public safety in the food industry.

This study should be considered in light of a few limitations. Findings are based on a small sample of stakeholder groups and to staff in leadership positions, though this

selection was intentionally diverse and included organizations and representatives that were identified to play a central role in the future of food working conditions, worker rights, and food safety in the United States. Participants were also organizational staff in leadership positions. Further, interpretation of the research agenda and study findings are necessarily subjective, and therefore vulnerable to participants' and researcher's personal biases. The resultant subjective and in-depth exploration, however, represents a primary goal of the study and adds to the conceptual generalizability of advancing the topic of working conditions as an issue of public safety.

6.6 Conclusion

This study adds a unique perspective to the literature about developing the policy agenda around poor food working conditions as an issue of food safety. As the issue of poor food working conditions and the problems of foodborne disease continue to gain traction on the national agenda, the perceptions and experiences of the key issue stakeholders described here may be useful for connecting these issues to better support food workers, food safety, and public health. Future research should consider the perspectives of other issue stakeholders, including food employers, consumer advocate groups, and advocacy organizations in other industries with significant consequence for public safety, that may help to define, adopt, and advance issues of food work and food safety on the public policy agenda. The involvement of public health researchers and advocates, who may conduct and translate research that draws clearer connections among working conditions, food workers, and public safety, and their relevance for the mission and strategies of key interest groups, will also be important to this work.

CHAPTER 7. DISCUSSION

7.1 Summary and Discussion of Findings

In this research, I sought to investigate and describe the role of food workers in relation to U.S. food safety. Exploring multiple perspectives, important insights were gained regarding legal constructions of workers in national food safety systems, food workers' perceptions about achieving proper food safety practice, and key stakeholder insights regarding opportunities and challenges for advancing the issue on the public policy agenda. The key findings across the three manuscripts are summarized and integrated below.

7.1.1 Manuscript 1: The Legally-Constructed Role of Food Workers in U.S. Food Safety

Manuscript 1 provided an analysis of the role of food workers in food safety as defined by FDA proposed regulations implementing the 2011 Food Safety Modernization Act (FSMA). Findings from this study demonstrated how the U.S. Food and Drug Administration, the primary federal agency responsible for ensuring U.S. food safety, currently defines food workers as hazards to food and the requirements that are identified to control and prevent these risks. While these definitions relate most directly to workers governed by the FDA, including food production, processing, and distribution workers, FDA food safety requirements serve as a model for state-level guidelines, such as the FDA Food Code, which apply to food retail and service sectors. The construction of workers in these documents, therefore, bears implications for food workers across the food system.

The analysis of proposed regulations revealed that food workers are identified as hazards to food safety primarily through individual factors such as poor health and

inadequate hygiene practice. The factors identified to influence these worker-related hazards were varied, and included limited consideration of the physical work environment (e.g., inadequate sanitary facilities and resources, long hours, large work spaces, transient schedules) and primarily emphasized the individual worker (e.g., lack of food safety knowledge and skills). Despite research and theory that identifies an important role for workers' social and structural contexts in shaping health and behavior, these factors were largely absent from federal requirements that define and manage this important food worker/food safety relationship.

In line with regulatory definitions of worker-related food hazards, the proposed regulations emphasize controls that focus on managing individual workers over managing workers' environments. These controls include requirements for mandatory worker training, including providing knowledge of proper health and hygiene behaviors (e.g., hand washing, glove use, and requirements to stay home or report to a supervisor when ill), and that training materials be standardized, multi-formatted, multi-lingual, and available in pictures to accommodate workers' education and literacy issues. In terms of accounting for the health and hygiene-related impacts of workers' social and structural context, the proposed regulations outline controls for sanitary facilities as sufficient—including information about the number, location, cleanliness, and stocking of workers' sinks and toilets (including access to soap, drying devices, and toilet paper).

The legally-constructed role of workers in food safety is further evident in the proposed regulations assignment of food safety authority to higher-level employees, including facility owners, operators, or agents in charge. In a few instances, the regulations

specify expertise that is considered to be valuable to ensuring safe food, including that of microbiologists, engineers, and metal contamination specialists. Given research that finds most food workers operate in front-line positions and, on average, hold a high school degree or less, these requirements systematically exclude the majority of food workers from the development, implementation, and enforcement of food safety systems in their place of work (Food Chain Workers Alliance, 2012). Further, these findings suggest that neither experts in public health, behavior, nor food workers (who arguably have the most intimate connection to food and the food system) are considered to be particularly central or important to building an effective food safety system and ensuring safe food in the U.S.

Finally, these accounts of food workers are shaped by FDA interpretation, which further reveals the current framework by which the U.S. food safety system understands and manages the relationship between food workers and food safety. Specifically, to develop the proposed regulations, the FDA necessarily interpreted and made decisions about relevant data, the definition and scope of the problem and its solution, and the perspectives and language that were appropriate for describing and defining the workers' role (e.g., "individual responsibility"). This study found that strategies to define and manage workers as a source of contamination are oriented around biological hazards to food. The analysis of hazards in relation to workers, then, is largely focused at the point of workers' interaction with food, and therefore constrained to factors at the point of the worker and within the walls of the food facility. The proposed regulations are further described as based on available food safety data. These parameters therefore depend on FDA employees' interpretation of what is and is not relevant food safety research.

While there are limited numbers of worker food safety studies that consider the impact of food working conditions on workers' food safety practice, this research does not seem to be translated within the proposed regulations (Carpenter et al., 2013; L. Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007). Furthermore, though there is ample social and behavioral science research that documents the impact of working conditions for employee health and behavior, these data are similarly absent from the development of federal-level standards. These findings suggest that these data, and a broader consideration for workers' social and structural context in shaping food safety, are not currently recognized by the FDA as relevant food safety literature to effectively implement the FSMA, as they are overlooked in federal constructions of a food safety role for workers.

Together, this study described federal interpretation of the range of factors that are relevant to the role of food workers in food safety. The study findings reveal a predominant individual-level theoretical orientation for understanding and managing workers' health and behavior for food safety, both for the FDA and within food safety literature. As these documents represent a foundation for food safety in the United States, the extent to which they accurately account for the role of food workers—a common source of foodborne contamination—is critical to the safety of the U.S. food supply. To help investigate this issue, and to further develop an understanding of the relationship between food workers and food safety, it is critical to also consider and relate these findings to the definition of this role as perceived by food workers within the context of their lives and working conditions (Manuscript 2).

7.1.2 Manuscript 2: Food Worker Perceptions of Factors Shaping Proper Food Safety Practice

The impact of additional factors beyond those considered by federal regulations (e.g., workers' food safety knowledge, skills and sanitary facilities) were further explored through in-depth interviews conducted with food service workers in Baltimore, Maryland, in Manuscript 2. Specifically, this study sought to prioritize food workers' perceptions of the food safety role within the context of workers' lives and working conditions. The manuscript examined the factors that impact workers' implementation of proper health and hygiene practices, as outlined by the 2005 FDA Food Code, or the state-level food safety standards for food service that are modeled from the FDA's federal-level requirements, such as the proposed regulations from Manuscript 1.

In Manuscript 2, I presented and discussed how food workers describe the importance of commonly identified influences, such as factors related to worker characteristics and the food work environment. I also noted participants' emphasis on an important role for additional factors in shaping health and hygiene practice (Carpenter et al., 2013; L. Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007). I analyzed interview data using the social ecological model, which revealed that additional facilitators or barriers to proper food safety practice related to multiple levels of influence, including the intrapersonal, interpersonal, institutional, community, and public policy levels. For example, at the intrapersonal level, workers emphasized that limited means, low wages, and a lack of access to resources like a personal washer and dryer challenged their ability to ensure clean uniforms. At the interpersonal level, many participants highlighted the impact of workers' relationships with management, co-workers, family, and friends in

shaping proper implementation of various food safety practices. In the workplace, participants described the health and hygiene impacts of formal and informal workplace policies, such as a lack of access to benefits like paid sick days, doctor's note requirements to prove illness, practices to conserve gloves, and uniform distribution and replacement policies.

Beyond identifying additional factors associated with the individual worker and the work environment, food worker participants extended the construction of their role in food safety to also account for the influences of factors in the community (including a lack of good jobs, long distances to work, and issues with transportation as well as health and hygiene-related services, such as primary care and clothing stores) and at the public policy level (including poor economic conditions and state and federal laws for reporting-time pay, benefits, and health insurance). Together, these findings suggest that from the food workers' perspective, the role of food workers in food safety is much more complex and related to workers' broader ecological context than its construction within federal food safety regulations.

While these factors represent the perceptions of a small sample of food service workers in Baltimore, Maryland, the study findings demonstrate how for food safety interventions to be effective, they must account for the range of factors that impact workers' food safety behaviors. A comparison of findings from Manuscript 2 to Manuscript 1 suggests that the primary regulations for the U.S. food safety system intend to control food workers in food safety—one of the most common sources of food contamination—without also accounting for many factors that may shape and impact this

relationship (Maxwell, 2005; Todd et al., 2008). The clear gap between the construction of the role of food workers in federal food safety regulations (Manuscript 1) and the construction of this relationship, including an emphasis on poor food working conditions, from the perspective of food workers (Manuscript 2), suggests a need to consider if and how these issues may be better integrated (Manuscript 3). More specifically, these findings raise significant questions about the opportunities and challenges for advancing poor food working conditions as an issue of food safety on the public policy agenda.

7.1.3 Manuscript 3: Key Stakeholder Perceptions of Advancing the Issue on the Public Policy Agenda

Manuscript 3 sought to examine the divide between the impact of workers' social and structural context on workers' food safety role (Manuscript 2) and the construction of this role within federal food safety regulations (Manuscript 1). Specifically, Manuscript 3 engaged with key stakeholders, or groups that represent increasingly formidable forces for advancing food work standards in the U.S., to examine the underlying factors, including opportunities and challenges, for connecting these issues in the food industry and on the public policy agenda (J. Fine, 2011).

All stakeholder participants were found to acknowledge the connection between poor food working conditions and food safety, yet very few participants indicated that they used the food safety issue to advance food work standards. Among a few groups that engaged this perspective, the approach was perceived to fall within and support organizational goals; however, participants defined a "food safety perspective" as they understood it, and in some cases this was interpreted as providing workers with food safety training or protecting workers from contaminated food. The majority of participants

identified a variety of reasons for not adopting a food safety approach, including a need to prioritize more pressing issues (food worker unemployment), a mismatch between work strategies (e.g., litigation) and addressing issues of health and safety, and uncertainty about the relative utility of a food safety frame over current issue frames, such as framing poor working conditions in term of social justice and human rights.

A number of participants also described difficulty in effectively translating the food work/food safety relationship. These concerns are complemented by findings from Manuscript 2, where participants detailed complex interrelationships among factors at multiple levels to account for food safety practice. Stakeholders further suggested that the connection among these issues may be more salient for sectors where workers are more visible to the public (e.g., service and retail) than for sectors where they are not (e.g., production, processing, and distribution). These perceptions aligned with the findings from Manuscript 1, where federal regulations for food processing, production, and distribution workers lacked a significant food work/food safety connection whereas in Manuscript 2, these connections were made explicit by workers in the food service sector.

In addition to connecting food work and food safety within specific food sectors, stakeholders described additional opportunities for making the food safety issue more accessible to key stakeholders, including engaging in what policy research defines as venue shopping, or identification of decision settings with the best chances of advancing policy goals (Pralle, 2003). These venues were identified in specific public audiences (e.g., students, religious groups, progressive areas), policy levels and programs (e.g., local regulations; private work standard certifications), and political leadership (e.g.,

policymakers with public health training). To help build these initiatives, stakeholders also suggested a central role for collaboration among diverse issue stakeholders (including food workers, food industry employers, food safety/consumer advocates, and the public health community). Underscoring these opportunities, stakeholders prioritized a need to address more fundamental policy problems that constrained the food worker population and likely prevented a useful discussion around food safety. These policy issues focused on stronger protections for workers to speak up about their conditions in the food workplace.

Findings from Manuscript 2 complemented these recommendations, as many food worker participants highlighted a fear of negative consequences (including loss of pay, hours, and employment) as a barrier to proper food safety practice and their overall engagement in the food safety process. Finally, even though stakeholder participants recognized opportunities to advance the food safety issue in future initiatives, findings on their current issue engagement—particularly in relation to theory on the agenda-setting process—reveal that these policy actors do not yet identify the food work/food safety issue as a social problem in need of government attention.

These findings may shed light on those from Manuscript 1, such that key interest groups focused on food workers and poor food working conditions may not yet contribute this perspective to the construction of workers within federal food safety regulations. Public health advocates may play a central role in addressing this gap by participating in the federal rulemaking process and drafting public comments that connect worker-based organizations' insights on food working conditions with consideration for food workers' health and safety, food safety, and public health.

7.2 Policy Implications and Recommendations

Based on the findings from the three dissertation manuscripts, I consider the implications for policy in this section. These key takeaway points include a series of recommendations about how to incorporate the lessons of this work into policy and practice-based initiatives to better account for the role of poor food working conditions in food safety and to enhance support for the food worker population in their responsibility to ensure safe food.

Develop more comprehensive food control programs across food system sectors

Food safety interventions, across food sectors, must account for the range of factors that impact workers' health and hygiene practice. Food control programs must complement a current regulatory and industry focus on worker training with interventions that address influences related to the food workplace (policies, resources, wages and benefits), institutional relationships (co-workers and management), and resources that workers identify as important to ensuring safe food (e.g., cleaning services, doctors/health services, sufficient uniforms, livable wages, affordable health insurance and paid sick days).

Based on food workers' perceptions of barriers and facilitators of proper food safety practice from Manuscript 2, I recommend the following intervention components:

- *Clean uniform requirements*: provide food service staff with regular access to washers and dryers for uniforms and/or provide workers with a free workplace cleaning service. Complement these practices with uniform distribution policies that provide at least as many uniforms (all components – pants, shirts, jackets, etc.) as the number of days that staff work in a given week. Supply extra uniforms in the

case of on-site contamination and where workers may engage in back-to-back shifts and not have the opportunity to clean garments before returning to work.

- *Requirements to not work ill, report illness to supervisor:* provide workers with health insurance and paid sick days as well as higher pay. Food facilities employing tipped workers should pay these employees higher wages up front, rather than having them rely on the inconsistent provision of tips. Food facilities should also provide workers with access to basic health services, which may occur through the development of an on-site health clinic or through identification of health services that are geographically nearby and affordable to food workers. Food facilities should hire enough workers to prevent understaffing and change staffing policies so that workers do not face pressure to identify a replacement when sick.
- *Proper handwashing and glove use practices:* institute strategies to prevent understaffing in the food workplace, including through hiring additional staff to fill in during the busiest customer hours. Ensure that workers have regular and sufficient access to a range of glove types (latex and single use) as well as sizes. Food facilities should also consider ordering glove types and sizes that reflect the composition and preferences of food facility staff, such as women with smaller hands or workers who desire latex options. Finally, food facilities should identify handwashing soap that is less harsh or abrasive on workers' hands.
- *Across food safety practices:* replace penal-based systems (e.g., strikes and points) with reward-based systems, where workers are positively reinforced for proper food safety practice (including through new job titles and resources like advanced health/safety training). Manager training should emphasize the importance of

including workers in food safety planning and implementation, showing care and respect for staff (including through holding meetings that welcome worker participation and input), and in working alongside workers to achieve food safety procedures, especially during periods of high customer volume and not only when health and safety inspectors are present. Food establishments should reflect that they prioritize food safety through facilities that are clean. Management should also embody a high food safety standard, through proper food safety practice, reminders, and enforcement.

- *Address contradictions between worker safety and food safety:* the development and implementation of food safety interventions should be conducted with input from worker health and safety regulators. These stakeholders should work together to ensure that standards to protect food do not inadvertently put workers at risk, including gloves that may impact workers' ability to handle knives safely.

These recommendations are based on findings on food safety practice among food service workers. It is likely, then, that important intervention components will vary by food system sector and even among the range of institutions within a given sector. Nevertheless, these recommendations represent a critical starting point for the development of more comprehensive and effective worker-related food safety interventions in the U.S.

Include workers and account for workers' social and structural context in federal food safety regulations

Federal food safety regulations should identify food workers as a source of authority in ensuring food safety, and call for their involvement in the process of identifying food safety hazards and developing food safety controls. Federal food safety

regulations should also include a broader set of controls that account for the range of factors that influence food workers' proper food safety practice, in addition to food safety knowledge. Aligned with the FSMA's regulation of food production, processing, and distribution facilities, worker-related controls in FDA proposed regulations should reflect the priorities of workers in these sectors. Findings on barriers and facilitators of proper health and hygiene practice as perceived by food service workers (Manuscript 2) may serve as a guide for this process. Food facilities that fail to include workers in food safety and that promote poor working conditions should be classified as hazardous under FDA proposed rules. Accordingly, these facilities will be subject to more frequent inspections and heavier documentation requirements.

The U.S. food safety system may more affectively support food workers and address issues of worker-related contamination by collaborating with worker-based organizations. These organizations have in-depth knowledge on food workers and the working conditions that impact workers' health and hygiene practice in a given sector (e.g. issues related to harassment in the production sector vs. temp/part-time work in the distribution sector). In some cases, these organizations have already developed comprehensive labor standards that may be adopted by federal food safety regulations to identify hazardous facilities and to better support workers in the food safety process.

Engage opportunities to inform development of federal food safety regulations

Given the lack of consideration for poor food working conditions in FDA proposed food safety regulations, there appears to be a need to develop these perspectives in a way that is accessible and clear to federal rulemaking bodies. Under federal rulemaking

procedures, the process by which government agencies promulgate regulations, there are a number of ways in which agencies involve the broader public. For example, during early stages of rule development, an agency may publish an Advance Notice of Proposed Rulemaking, which invites the public to weigh in on and shape a developing rule, such as the FDA proposed regulations to implement the 2011 FSMA (The Office of the Federal Register, 2011b). This notice also begins what is called the notice-and-comment process. Through this system, anyone may submit a comment (electronically or by mail) to inform and improve an agency's proposed plan. Through the public comment process, a variety of issue stakeholders, including those outlined by stakeholder participants in Manuscript 3, may help agencies like the FDA draw connections between food working conditions and workers' health and hygiene practice, and subsequently incorporate these issues into the basis of future food safety rules.

Connect the missions and work of federal agencies engaged in labor and food safety

In a 2014 report developed by the Congressional Research Service for the members of Congress, the federal agencies related to food safety were defined as the U.S. Food and Drug Administration, U.S. Department of Agriculture, Environmental Protection Agency, Customs and Border Protection, National Oceanic and Atmospheric Administration, Department of Justice, Federal Trade Commission, and the Alcohol and Tobacco Tax and Trade Bureau (Johnson, 2014). Noticeably absent from this set are federal agencies responsible for food workers' wage and hour standards and the assurance of safe and healthful working conditions, such as the U.S. Department of Labor and including the Occupational Safety and Health Administration (OSHA) (U.S. Department of Labor, 2014a).

Further, in my paper analyzing the construction of workers in FDA proposed regulations, across the variety of stakeholders identified to hold authority in this food safety system, I found only limited mention of federal labor-related agencies, such as a reference to OSHA regulations for sanitary facility requirements. These findings suggest that the fission among food working conditions and food safety is also rooted within federal government structure, such that issues related to labor and food safety are constructed as distinct responsibilities under distinct governing bodies.

A common critique of the U.S. food safety system is that it is fractured, and a range of organizations such as the National Research Council, the Food Marketing Institute, and the Government Accountability Office, have pushed, for decades, for its reorganization (Nestle, 2010). To expand on these critiques, however, my findings indicate an additional structural opportunity for food safety improvement: a reevaluation of relevant food-safety agencies that includes the U.S. Department of Labor (and associated administrations) in federal food safety work.

Support stronger local, state, and federal workplace rights and protections for food workers

Based on my findings of food worker and stakeholder participants concern regarding engaging food safety in relation to the vulnerability of, negative consequences experienced by, and lack of protection for workers in the food industry, I recommend that initiatives to improve U.S. food safety must also include initiatives to improve food workers' labor protections. These actions should include the right for all food workers to organize and stronger protections against retaliation. According to a 2012 report published by the Food Chain Workers Alliance, policymakers should also increase penalties for

employers that abuse workers' rights, including those that engage in retaliation as well as wage theft and other forms of exploitation (Food Chain Workers Alliance, 2012). Given the large numbers of undocumented workers in the food industry, there are also opportunities to support the role of food workers in food safety—and to protect against exploitation—through renewed efforts to pass U.S. immigration reform.

Finally, while federal-level regulations represent a foundation, or a floor by which state and local food safety and labor policies may be modeled and shaped, my findings suggest that starting this work at local and state levels, and institutionalizing these changes both through government policy as well as through independent initiatives (such as fair labor programs developed by non-profit and private sector groups), represents a more efficient and feasible approach for advancing this work.

Evaluate and learn from ongoing and independent food work/food safety initiatives

In limited instances, there are organizations that have begun this work through the development of independent systems for advancing labor standards in the food industry. Two examples of these programs are Oxfam's Equitable Food Initiative (EFI) and The Coalition of Immokalee Workers' Fair Food Program (FFP). For EFI, the intention to develop new standards for working conditions is explicitly joined with standards for pesticide management and food safety, such that the issues are understood as interrelated and perceived as mutually enforcing (Equitable Food Initiative, 2014). For the FFP, which includes improved labor standards for Florida's tomato workers, the intention is to, "affirm the human rights of tomato workers and improve the conditions in which they labor," where a food safety connection is not explicit (Coalition of Immokalee Workers, 2012).

Nevertheless, both programs work through partnership among produce workers, growers (or employers), and retailers to promote working conditions, health, and safety above and beyond the requirements established by existing government regulations and labor protections.

These programs represent valuable case studies for advancing an understanding of, and the ability to address, poor working conditions as an issue of food and public safety. Public health researchers and practitioners should be concerned with the evaluation of these efforts, particularly with regard to the impact of each standard on workers' health and hygiene practice and for reducing food contamination and outbreaks. As each program includes diverse components or tools to improve working conditions, these evaluations also represent opportunities to identify new food safety indicators and points for intervention that are directly related to working conditions. Thus, supporting and investigating these programs is important to future food safety research as well as for enhancing local, state, and federal government frameworks for ensuring safe food.

Increase collaboration among key issue stakeholders

To help develop the connections among these issues, my findings reveal the importance of collaborating with a diverse array of interest groups. For example, ongoing partnerships between food worker advocate centers and unions may more effectively identify the connections among food work and workers' health and hygiene behavior with support from the public health and broader academic community, including social and behavioral scientists. Further, developing these issues into a food safety frame may benefit from the input of groups that know this landscape and have pre-formed strategies to

engage with policymakers on the issue, such as food safety-related institutions and consumer groups. Finally, my research suggests that grounding these issues in the everyday realities of food work and in a manner that may be understood and adopted in the workplace requires direct input from food system workers as well as the food industry.

With important caveats that are identified and discussed in my third manuscript, partnerships to advance poor food working conditions as an issue of food safety may also benefit from engaging with leaders from other industries, such as transportation and health care, where the consumer impacts of poor working conditions are more established. By learning the process by which stakeholders in these industries incorporated this perspective, interest groups in the food industry may identify new strategies, as well as better determine how their strategies may need to differ to achieve similar gains on the public policy agenda.

7.3 Research Limitations and Strengths

This research should be considered for both its limitations and strengths. One limitation is related to the composition of the sample. Phase 1 (Manuscript 1, document review) relies on federal regulations that are currently being shaped within the federal rule-making process. These data are available in the proposed rule form, which limits the study aim to how the U.S. food safety system *proposes* to define the role of food workers in food safety, rather than how it may do so in final form. The proposed regulations also fall under the jurisdiction of the FDA, which represents one of a number of public health agencies responsible for shaping the food safety system. Other federal agencies, however, have separate yet important food safety roles, including the USDA's jurisdiction over most meat

and poultry processing. Therefore, by choosing to focus on the FSMA (unprecedented change to food safety in the U.S.), certain study findings necessarily omit consideration for some worker populations (e.g., slaughterhouse workers) and food safety agencies (USDA).

Next, I conducted food worker interviews with individuals from one of the five food sectors. This focus limited the extent to which worker perceptions could be described and compared across sectors. I also recruited food workers using Baltimore's Craigslist, which limited the sample to individuals who had access to the internet, as well as email and/or a phone. These restrictions extended to the fact that recruited workers had to also be aware of Craigslist.org and be actively reviewing the site for opportunities. Individuals who access Craigslist.org, including food service participants, may be more likely than non-users to be searching for jobs and/or in-between positions. These factors should be considered as sampling restrictions for Manuscript 2.

In Manuscript 3, I used criteria-based selection to identify a small sample of stakeholders, including food worker advocate centers, unions, and related organizations. An important strength of this narrowed selection is the identification of sources that may provide the most information about the phenomena under study—a primary goal of qualitative research. Accordingly, these groups represent some of the most active organizations working to advance food working conditions in the U.S., as well as those who are increasingly engaged in partnerships with similar groups to achieve these goals.

At the same time, however, my findings from this phase (Manuscript 3, stakeholder interviews) should be interpreted with recognition that this sample and the associated perspectives are not representative of all organizations engaged on these issues.

Furthermore, despite extensive efforts to gain participation of all groups meeting study eligibility criteria, not all those who were invited to participate chose to do so. Groups that did not participate, however, represent additional members of umbrella organizations that were otherwise represented by study participants, which may suggest that important experiences and insights were still captured. Further, to support the transferability and credibility of findings from these phases, I recorded rich and detailed descriptions of study settings, participants, selection criteria, and other factors by which data were collected and interpreted. These details may help readers to determine the applicability of this study to other contexts.

Finally, the potentially sensitive nature of the study topic means that there is the possibility that connecting poor working conditions to contaminated food may suggest unhelpful conclusions, such as a blame-the-worker mentality. This challenge is not new, however, and my research was inherently positioned with the intention of understanding this relationship as an issue of the system, rather than individual-level characteristics of the worker. To help ensure that this perspective is effectively communicated, my research engages the insights of key stakeholders who may guide findings and recommendations to be developed in a manner that limits this challenge.

There are several strengths of this research. Though the study aims are broad, the publicly available documents that I used in phase 1 (Manuscript 1, document review) represent a strength for the fact that they are readily available, quickly gathered, and encourage early data analysis, a central facet of effective qualitative research (Silverman, 2011). My investigation of these regulations also represents a timely and effective

approach for interpreting the most current thinking on this topic from a federal perspective. Further, my decision to use documents and interviews, including vignette-based data, provide a variety of perspectives, or social realities, that add to the credibility of the study through breadth, richness, and depth regarding the role of food workers in food safety (Silverman, 2011).

The use of qualitative methods is another central strength of this work. The relationship between food workers and food contamination has been primarily assessed quantitatively and through data describing individual-level factors as representative of the primary and most important sources of worker-related food risk. This is the first study to explore this relationship from a systems perspective, including the application of the social ecological model to the issue. Furthermore, it is the first study to prioritize workers' perceptions of a social and structural context that shapes the role of food workers in food safety. My research adds this perspective to the literature through rich qualitative description and exploration of the food worker-food safety relationship as it may be constructed in regulations and from the perspective of the worker and key stakeholders. Ultimately, this research identifies where we now stand in accounting for the role of food workers in food safety, which represents a fundamental first step in engaging researchers and policymakers on the topic of poor food working conditions as a food safety issue.

7.4 Future Research

My study findings reveal a number of key areas for future research. Based on the omission of poor working conditions from the legal construction of workers in food safety as well as key stakeholders concerns about engaging a food safety frame, future research

should focus on developing clear and explicit connections among these issues. These studies should consider drawing these connections within the five main sectors of the food system and considering how the unique and shared vulnerabilities of workers in each sector (such as large numbers of undocumented workers in production and part-time workers in retail) impact and relate to food safety.

Social and behavioral scientists can play an important role in this work, especially given their access to theoretical frameworks that account for multi-level influences on health and behavior, and including social and structural determinants. Given that the definition of workers as a source of contamination influences the types of interventions that are recognized as sufficient and appropriate to address the issue, this research should focus on reshaping how we think about and account for the relationships among food workers, their health outcomes and behaviors, and food safety. Specifically, this research should promote the adoption of a wider lens for interpreting the social and ecological range of factors that come to shape and impact population health and behavior, and ground these investigations within the food safety literature.

To complement findings from Manuscript 3 (stakeholder interviews), and to build upon recommendations for increased collaboration, future research should also examine the engagement and perspectives of other key interest groups, such as consumer food safety groups. Specifically, to what extent do these organizations consider a role for poor food working conditions in their work? Further, what strategies may help to develop a connection among their food safety work and that of food worker advocate centers, unions, and related groups?

To investigate the opportunity of shaping future food safety regulations through participation in the public comment process, future research may analyze the public comments submitted in relation to the FDA proposed regulations from Manuscript 1. Specifically, researchers may submit a Freedom of Information Act (FOIA) request for the release of all public submissions for these proposed regulations. A review of these submissions may consider the profile of the participating public, including whether submitters also include food workers and/or food worker-related groups. The text of public comments may similarly be reviewed for if and how food workers and poor food working conditions are discussed.

7.5 Conclusion

There is growing public awareness for the poor state of food working conditions in the U.S. Over the last two years, food workers in over 150 U.S. cities have walked off the job to bring attention to the struggles of work in the food industry and to fight for improved labor conditions (Wessler, 2014). At the same time, a team of journalists at the reporting service Food Safety News churn out daily reports on foodborne illness outbreaks across the nation, many of which originate with food workers through poor health and hygiene practices (Marler, 2014).

My dissertation sought to bring these issues together, and to advance our understanding of the role of food workers, and poor food working conditions, in relation to food safety. Through a qualitative investigation of federal food safety regulations, the food safety perspectives of food workers in Baltimore, Maryland, and insight from key issue

stakeholders, the results from my research suggest that advancing U.S. food safety also requires consideration for the conditions in which food workers live and work.

In order to effectively connect and align these issues, change must occur at multiple levels and extend beyond the confines of the food work environment. These changes may be more likely if they are pursued through partnerships among key issue stakeholders, including food worker advocate centers, unions, and related groups, food industry employers and workers, consumer and food safety groups, and the public health community. While more research is needed to understand the varied and complex connections among issues of food work and food safety, this dissertation provides an important foundation to this literature, and the results may guide the development of future food safety interventions that better support food workers in the process of ensuring safe food.

APPENDICES

Appendix 1: FDA Proposed Regulations Codebook

Codebook Manuscript 1 (FDA Proposed Regulations, Document Review) – Mainline Codes		
Main Codes	Definition	Select Passages from Text
Workers as Hazards	Text on the worker [body, health, behavior, and hygiene] as a hazard: <ul style="list-style-type: none"> - Nails, hair, skin - Sore, sickness, rash, etc. - Clothing, accessories - Working while ill - Personal hygiene; insanitary practices - Language/literacy 	<p><i>human pathogens constitute a biological hazard with the potential to cause serious adverse health consequences or death...</i></p> <p><i>Contamination of food with some pathogens (e.g., norovirus) is often due to poor employee hygiene or practices.</i></p>
Living & Job Conditions as Hazards	Text on workers' living and working conditions as hazards to food safety: <ul style="list-style-type: none"> - Work pace, hours - Position/ power/ relationships/harassment - Physical env., resources (gloves and soap) - Low wages; lack of access to benefits <p>&</p> <ul style="list-style-type: none"> - Family structure & health; networks; immigration status; access to health care/primary care, etc. <p>&</p> <ul style="list-style-type: none"> - Power, violence, discrimination, history - Turnover; seasonal work schedules - Immigration, wage & other work policies; - State or federal labor rights 	<p><i>Dirty and damaged gloves may contaminate produce.</i></p> <p><i>With regard to equipment and buildings as a route of contamination— Food contact surfaces are potential routes of contamination of produce...</i></p> <p><i>No matter the transient nature, any worker can be a potential pathway for contamination of produce... [implies recognition of relevance in seasonal nature of work]</i></p>
Controls	Text describing controls for worker, living, and job -related hazards. Include text discussing <u>the control</u> itself as well as its <u>intended purpose and anticipated outcome</u> . Include discussion of the food safety plan and hazard analysis as a control. For example: <ul style="list-style-type: none"> - Training & discussion of content and timing - Hairnets, beard covers, storing personal items elsewhere; eating elsewhere - Text on toilet and hand washing facilities; provision of gloves, aprons - Exclusion from work while ill; removal of ill or infected workers - Text on supervision and related requirements 	<p><i>Proposed would identify the purpose of the hazard analysis—to determine whether there are hazards that are reasonably likely to occur [control purpose]</i></p> <p><i>The presence of adequate toilet facilities in reasonable proximity to growing areas [control] can reduce produce contamination [outcome]</i></p> <p><i>Educating personnel who conduct covered activities in which they contact covered produce and supervisors about...</i></p>
Authority	Text describing <u>people, titles, agencies, data, and organizations</u> (etc.) as authorities or stakeholders in food safety. Include text regarding <u>roles, requirements, and responsibilities</u> . Include text about a <i>qualified individual</i> .	<p><i>A qualified individual must develop the food safety plan in order to ensure ...designing a plan requires an individual who is...</i></p> <p><i>One way to comply could be for a team of individuals ("HACCP team" or a "food safety team") to develop the food safety plan</i></p>

Worker-Relevant Sections of Text Identified for Each Proposed Rule

Table 1. Proposed Rule: Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food - Worker-Relevant Sections			
Section Name/Title	Page	Section	Topic(s) Covered
XI. Proposed revisions to CGMP Requirements, Part 110 (Proposed 117, Subpart B)	3719-20	E -110.10 – Personnel (proposed 117.10)	Revisions to CGMP that have to do with food workers 74-75
	3722-23	H – Proposed revisions to current 110.37 <ul style="list-style-type: none"> Proposed 117.37 - Sanitary facilities and controls 2, 3 	Revisions to CGMP part d and e (toilets and hand washing facilities) 77-78
XII. Proposed Requirements for Hazard Analysis and Risk-Based Preventive Controls (Proposed 117, Subpart C)	3730-32	A - Proposed 117.126 – Requirements for a Food Safety Plan, 3730-3732;	Preparation of the Food Safety Plan by a Qualified Individual; Facility-Based Nature on Written FS Plan; 85 - 87
	3732-38	B – Proposed 117.130 - Hazard Analysis (3732-3738)	Establishes requirement to identify and evaluate hazards]3738, 117.130 requires consideration of sanitation, including employee hygiene (in hazard analysis) 87-93
	3738-39; 3741-3744	C – Proposed § 117.135—Preventive Controls for Hazards That Are Reasonably Likely To Occur 2. Requirement To Identify and Implement Preventive Controls for Hazards that Are Reasonably Likely To Occur 7. Sanitation Controls (starts at 3741)	Guidance and proposed requirements to evaluating and identifying hazards to food safety 93 - 100
	3761-62	H – proposed 117.155 – Requirements Applicable to a Qualified Individual	Definition of a “qualified individual” 116 -117
Current Good Manufacturing Practices (CGMP) (Current Part 110, Subpart A – General Provisions)	1	A -SSOPs not updated by proposed rule: part (a) Disease Control, (b2 – maintaining personal cleanliness, b3 – washing hands, b4-jewelry, b6 – hair nets, 7 – storing personal clothes/items, b8 – confining to areas during certain activities)	<i>Exclusion when ill</i>
Current Good Manufacturing Practices (CGMP) (Current Part 110, Subpart B, Buildings and Facilities)	1	B –110.37: SSOPs that are not updated within this proposed rule, as specified on FR 3743 – b (plumbing), c (sewage disposal),	“the other six areas [of the SSOP]” – FDA declares this sufficient to address any hazards; further requirements in these proposed rules deemed not necessary (3743)

Table 2. Proposed Rule: Standards for the Growing, Harvesting, Packing and Holding of Produce for Human Consumption- Worker-Relevant Sections			
Page	Section Name/Title	Section	Topic(s) Covered
3522-3524 (2)	IV. Regulatory Approach	A. Qualitative Assessment of Risk B. Focus on Biological Hazards	Qualitative Assessment of Risk and Routes of Contamination, with coverage of workers as route of contamination. Explanation for regulation standards and hazard selection [20-22]; Discussion of biological hazards
3554 – 3556 (3)	V. The proposal	Subpart C - 112.21, 112.22, 112.23 Documentation of training – 112.30	Personnel Qualifications and Training Requirements [52-54]
3556-3559 (3)		Subpart D - 112.31, 112.32, 112.33	Health and Hygiene Requirements [54-57]
3592-93 (2)		Subpart L, section h (toilet & hand-washing facilities) - 112.129	Requirements for Toilet & Hand-Washing Facilities under Equipment, Tools, Buildings, and Sanitation [90-91]
*Proposed standards in subparts C, D, and L are the same across all covered growing, harvesting, packing, and holding operations (FR, 3529)			

Appendix 2: FDA Proposed Regulations – Second Coder Coding Guide

Documents:

- You will receive 4 documents (25 pages) to code:
 - 1) **Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food:** 3730, 3731, 3732, 3733, 3741, 3741, 3742, 3743, 3744, 3761 (10 pages)
 - 2) **Standards for the Growing, Harvesting, Packing and Holding of Produce for Human Consumption:** 3522, 3523, 3524, 3554, 3555, 3556, 3557, 3558, 3559, 3592, 3593 (11 pages)
 - 3) **CFR-Subpart B Buildings and Facilities** (2 pages)
 - 4) **CFR -Subpart A_ General Provisions** (2 pages)
- Text **within** red boxes should be coded with the 4 mainline codes: (1) *Workers as Hazards*, (2) *Living & Job Conditions as Hazards*, (3) *Worker Controls*, and (4) *Authority*

Research Aim:

To describe the role of workers in food safety as defined by FDA proposed regulations implementing the 2011 Food Safety Modernization Act (FSMA).

Background on Documents:

To describe how the U.S. Food Safety system attends to the role of food workers in ensuring food safety, this study reviews two proposed rules developed by the FDA to implement the 2011 Food Safety Modernization Act (FSMA). These rules are considered the heart of a new food safety system in the U.S. They are called:

- Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food
- Standards for Growing, Harvesting, Packing, and Holding of Produce for Human Consumption

These rules outline FDA interpretations of (1) best practices that significantly reduce the occurrence of hazards for food that is manufactured, processed, packed or held by a food facility as well as (2) standards for the safe production and harvesting of produce (raw fruits and vegetables). Limited sections of these texts describe the role of food workers in this process. These sections are the ones included here for coding.

Getting Started:

- 1) Open Atlas.ti
- 2) Create a new Hermeneutic Unit (HU)
- 3) Save the HU in the same place as the PDF files that you will code (and give the HU a name with your initials, such as “Coding_Mainline_SR”).
- 4) Load the edited PDF files into the document manager (you should receive these via email; **4 documents total**)

- a. Click on “Project”
- b. Select “Add Documents”
- c. Select “Add Documents (My Library)”
- d. Navigate to where the documents are located and add each one. They should then show up in the Documents Manager drop down bar at the top left of the main Atlas.ti window.

5) Add your **main codes** to the Codes drop down menu

- a. Click on the “Codes” grey button (next to the drop down menu for codes)
- b. Click on the rectangle icon with the little yellow star on its top left corner (if you hover over it, it will say “create new item”); alternatively, you can click on “codes” on the upper left and select “create free codes”
- c. Type in the code names in the blank boxes
- d. Click OK.

Coding

Qualitative coding is like creating a filing system. We are placing data in the code like a folder. A systematic way of applying the codebook is by asking questions as you read:

- What is this saying? What does it represent?
- What is this an example of?
- What is happening?
- What kind of events are at issue here?
- What is trying to be conveyed?

Points to Remember

When you identify text that is applicable to a code, make sure to capture some of the surrounding text to provide some context for later readers. Though you should use your judgment on how much “surrounding” text is necessary to achieve this goal, usually try to keep as close to the relevant content as possible.

Overall, always err on the side of over-coding (vs. under-coding). For example, if there is a sentence or term that you believe may fit under a code (or two codes – which will happen) you should code it. For example, the term “agricultural practices,” may refer to job-related factors or worker-related factors (e.g., hand washing/hygiene). Since it is unclear, you would want to apply both the **worker hazards** and the **Living & Job Conditions as Hazards** codes.

Implied/Tacit Content

Some text may imply a risk – either related to the worker or his/her job, or other structural factors. For example, the following sentence implies there may be facets of the worker’s job that complicate hygienic practice, though this is not explicitly stated:

“Under proposed § 112.32(b)(3), we would not expect workers to immediately stop work and wash their hands each time hands become soiled during the usual course of farm work

with dirt or plant litter. However, we would expect workers to have sufficient training to recognize potential sources of hazards and to wash their hands when appropriate.” [FR, 3558]

We would code this section under the “Living & Job Conditions as Hazards” code. This text may also be double-coded with the “control” code.

Refining Codes

During the coding process, it is normal to add, collapse, expand, and revise coding categories. Sometimes, what one expects to find is not there. Some codes just do not work and others end up capturing too much data. In the latter case, the code may need to be broken into sub-categories. If you find that this is happening while coding, do not worry. This is normal, and I will want to capture your thinking.

Based on your experience, let me know your thoughts, ideas, concerns, changes, (etc.) could be made – to any code or generally – to allow codes to better fit the data and to capture the issues of interest.

Type thoughts here...

Coding Notes:

During coding, it is important to note ideas or reactions as they emerge. These notes may include new interpretations, coding categories, or connections with other data.

Type thoughts here...

Appendix 3: FDA Proposed Regulations – Example of Coded Text

3730 Federal Register / Vol. 78, No. 11 / Wednesday, January 16, 2013 / Proposed Rules

Example of text coded for the “authority” coding category

N. Request for Comment on Additional CGMP Requirements

We request comment on any additional proposed revisions or clarifications to our CGMP regulations that should be included in subpart B, including whether to further implement the “opportunities” for CGMP modernization identified by the CGMP Working Group or to enhance the CGMP regulations in some other way. For example, we request comment on whether a final rule based on this proposed rule should include CGMP requirements for environmental monitoring for *L. monocytogenes*, and whether such requirements should include other environmental pathogens such as *Salmonella* spp. If so, we also request comment on what such requirements should be. For additional information on environmental monitoring for *L. monocytogenes* and *Salmonella* spp., see sections I.D and I.E of the Appendix to this document.

XII. Proposed New Requirements for Hazard Analysis and Risk-Based Preventive Controls (Proposed Part 117, Subpart C)

A. Proposed § 117.126—Requirement for a Food Safety Plan

1. Requirements of Section 418 of the FD&C Act

Section 418(h) of the FD&C Act requires that the owner, operator, or agent in charge of a facility shall prepare a written plan that documents and describes the procedures used by the facility to comply with the requirements of section 418 of the FD&C Act, including analyzing the hazards under section 418(b) of the FD&C Act and identifying the preventive controls adopted under section 418(c) of the FD&C Act to address those hazards. Section 418(h) of the FD&C Act also requires that such written plan, together with the documentation described in section 418(g) of the FD&C Act, shall be made promptly available to a duly authorized representative of the Secretary upon oral or written request.

2. Proposed § 117.126(a)—Requirement for a Food Safety Plan

Proposed § 117.126(a) would require that the owner, operator, or agent in charge of a facility prepare, or have prepared, and implement a written food safety plan. We use the term “written food safety plan” in proposed § 117.126(a) to mean the “written plan” referred to in section 418(h) of the FD&C Act. To make clear that the written plan is related to food safety rather than other plans a facility may have (such as quality control plans), we have designated the “written plan” to “food safety plan.”

Proposed § 117.126(a) would require that the plan be written as is expressly required by section 418(h). A written food safety plan is essential for the facility to implement the plan consistently, train its employees, and periodically reanalyze and update the plan. It is also essential to a facility’s food safety team, to auditors, and to inspectors. Proposed § 117.126(a) would implement section 418(h) of the FD&C Act and is consistent with the NACMCF HACCP guidelines, the Codex HACCP Annex, and Federal HACCP regulations for seafood, juice, and meat and poultry. The recordkeeping provisions of the NACMCF HACCP guidelines recommend that the HACCP plan include a list of the HACCP team and assigned responsibilities; a description of the food, its distribution, intended use, and consumer; a verified flow diagram; a HACCP Plan Summary Table that includes information for steps in the process that are CCPs, the hazard(s) of concern, critical limits, monitoring, corrective actions, verification procedures and schedule, and record-keeping procedures (Ref. 34). The Codex HACCP Annex recommends that HACCP procedures be documented, including the hazard analysis, and determinations of CCPs and critical limits (Ref. 35). Federal HACCP regulations for seafood, juice, and meat and poultry require a written plan (§§ 123.6(b)) and 120.8(a) and 9 CFR 417.2(b), respectively).

Proposed § 117.126(a) would provide flexibility for the owner, operator, or agent in charge of the facility to either prepare the written food safety plan or have that plan prepared, in whole or in part, on its behalf. This flexibility is consistent with the NACMCF HACCP guidelines (Ref. 34), which advise that a HACCP team may need assistance from outside experts who are knowledgeable in the hazards associated with the product and the process. This flexibility also is consistent with the Codex HACCP Annex, which acknowledges that small and/or less developed businesses do not always have the resources and the necessary expertise on site for the development and implementation of an effective HACCP plan and recommends that expert advice be obtained when necessary from other sources, such as trade and...

Appendix 4: Food Worker Recruitment Advertisement (Baltimore's Craigslist)

FOOD SERVICE WORKER RECRUITMENT SCRIPT

[To be posted to Craigslist and other related outlets; may be printed on flyers for public/community bulletin boards]

Participate in a research study about working in a food service job!

A doctoral student at the Johns Hopkins School of Public Health is looking for individuals age 18 or older who:

- Prepare, cook, or serve food in a fast-food, full-service, or take-out/carry-out restaurant in Baltimore, Maryland
- Have worked in one of these positions for at least 3 months
- Are fluent in English

The purpose of the study is to understand food worker thoughts about working in a food job and keeping food safe. The interview involves talking about food work and food safety scenarios.

Your participation involves a 40-60 minute interview. The study also includes one page of questions about food jobs and basic demographic information. Information collected during interviews will be strictly confidential, and I will not release any information that may be linked to you.

Eligible participants will be given \$20 cash for their participation.

If you are interested in participating, or have any questions, please contact Megan at MClayton@jhsph.edu.

JHSPH IRB#5187

Study Title: A Qualitative Exploration of the Role of Food Workers in US Food Safety

Screenshot of the Recruitment Advertisement on Baltimore's Craigslist

Paid Food Workers Research Study

Participate in a research study about working in a food service or food processing job. Eligible participants will be given \$20 cash for participation.

A doctoral student at the Johns Hopkins School of Public Health is looking for individuals age 18 or older who:

- Prepare, cook, or serve food in a restaurant in Baltimore, Maryland
- OR
- Handle unpackaged raw food (produce, seafood) or ready-to-eat foods (snacks, baked goods) in a processing facility or food factory in Baltimore, Maryland
- AND
- Have worked in one of these positions for at least 3 months
- Are fluent in English

The purpose of the study is to understand your thoughts about working in a food job and keeping food safe. The interview involves talking about food work and food safety scenarios.

Your participation involves a 45 minute interview. The study also includes one-page of questions on food jobs and basic demographic information. Interviews are anonymous; I will NOT collect names or release any information that may be linked to you.

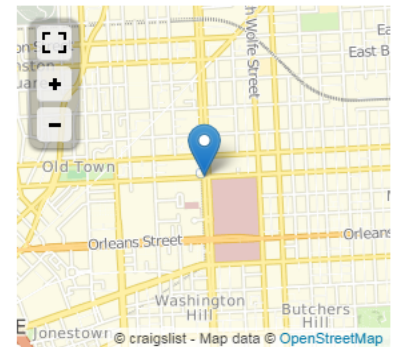
Interviews will take place at the Public Health School (624 North Broadway, 21205) or another mutually agreed upon location away from the work site.

To arrange an interview, or if you have questions, please contact me.

JHSPH IRB#5187

Study Title: A Qualitative Exploration of the Role of Food Workers in US Food Safety

- do NOT contact me with unsolicited services or offers



[\(google map\)](#) [\(yahoo map\)](#)

Appendix 5: Food Worker Participant Questionnaire

1. What is your job title? _____
2. What are your job responsibilities?
 - ☐ **Food preparation**
 - ☐ **Cooking**
 - ☐ **Dishwashing**
 - ☐ **Food Storage**
 - Other:** _____
3. How long have you worked at your job?
 - ☐ **0 to < 2 years**
 - ☐ **2 to <6 years**
 - ☐ **6 to <10 years**
 - ☐ **≥10 years**
4. Do you or does anyone in your household participate in any of these programs? (Check all that apply):
 - ☐ **SNAP (Food Stamps)/EBT**
 - ☐ **WIC**
 - ☐ **School Breakfast/School Lunch**
 - ☐ **Head Start**
 - ☐ **SSI**
 - ☐ **Other:** _____
 - ☐ **None**
5. Do you get Paid Sick Days (paid time off when you are sick) from your job?
 - ☐ **Yes**
 - ☐ **No**
 - ☐ **Don't Know**
6. Do you have access to Health Insurance?
 - ☐ **Yes → Is it from your job?** ☐ **Yes** ☐ **No**
 - ☐ **No**
 - ☐ **Don't Know**
7. What is the highest level of formal education you have completed?
 - ☐ **Elementary or some high school**
 - ☐ **High school diploma**
 - ☐ **Vocational school or technical college or some college**
 - ☐ **4-year college degree or more**
8. In what year were you born? _____
9. Please indicate: ☐ **female** ☐ **male**

Appendix 6: Food Worker Interview Scenarios

NOTE: In scenarios, all workers are in food service and handle food.

Scenario 1

Part 1: A worker is told to wear gloves for certain food handling tasks, including when he or she handles ready-to-eat foods. This worker is also told to change gloves between handling raw meat and ready-to-eat food. There are times when the worker does not follow these instructions or feels unable to wear or change gloves when doing this work.

- Considering your own experiences, why do you think this would occur?
 - Probe: What was the worker thinking about - when they decided not to wear gloves?
 - Probe: Why else might a worker not wear gloves?

Part 2: A worker is told that they must maintain their gloves, which means that if the gloves are used to handle food, the worker must make sure they are intact, clean, and in sanitary condition. Often, however, the worker uses gloves that do not meet these standards OR the gloves are not kept up to meet these conditions.

- Thinking about what it is like to work in a food workplace, tell me why you think this worker would do this?
- What factors impact the workers' ability to maintain gloves?

Scenario 2

Part 1: A worker is instructed to wash his or her hands - scrubbing with soap and running water and drying - in a sink at the following times: (1) before starting work, (2) before using gloves, (3) after handling raw meat, (4) each time he or she leaves her work station, and (5) at any other time where hands could possibly become dirty (e.g. touching the floor, waste, trash cans, and using the toilet). This worker, however, feels unable to wash hands as frequently as he or she is told to do so. In other words, sometimes he or she does not wash hands with soap, sometimes he or she does not wash hands after handling raw meat and before handling other food, or each time he or she leaves her work station.

- In relation to the typical food workplace, talk about why do you think this worker – or a worker you know – does not always wash hands or is unable to wash hands?
 - What factors may this work, or one of your colleagues, think about when she made the decision *not* to wash her hands in these cases?
- What would happen if this worker DID follow these instructions? Would there be any impacts?
 - What happens? What are the consequences of this?

Scenario 3

Part 1: A worker is asked to work while wearing personal clothing or other outer garments that are clean, and that protect against contaminating food, food surfaces, and food packaging materials. [Outer garments include the clothes they arrive to work in, or other work clothes they put over these clothes.] There are workers at this job, however, that are not wearing clothes that meet these requirements while they work.

- Talk to me about why – or factors that influence – this situation. Why would these workers not be wearing clean outer garments?

Part 2: A food worker is expected to wear different outer garments, over their clothes, when they are doing something that has a high chance of contaminating the worker's personal clothes with hazards that can get in food. These outer garments, such as aprons, smocks, or coveralls are to be put on by worker whenever they do these other tasks – such as moving garbage or dealing with the restrooms – and removed before the worker moves on to other activities. Sometimes workers do not wear these outer garments to do these tasks, and wear their regular clothes.

- Why do you think they would do this? What factors may affect their decision?

Scenario 4

Part 1: It is the beginning of a work week, and one of your co-workers is feeling sick, which may include vomiting or diarrhea. Your job says that someone should not be at work if a doctor or other medical professional says that they have a sickness that could spread to other workers or to food.

- Do you think the worker would go to a doctor to confirm that she is ill? Why? Why not?
 - Probe: Is this worker does not go to the doctor, why do you think that would be?

Part 2: All food workers at this job are instructed to report their illness to a supervisor, who will exclude them from work. This coworker of yours, who is sick, shows up to work and does not tell the supervisor that they are sick. They continue to handle food.

- 1a. Why do you think this worker went to work sick?
- 1b. Let's say the worker said they were *UNABLE* to stay home (had to go to work sick) - why would they say that?
- 2a. Tell me why you think this worker – or a colleague of yours – would not tell their supervisor that were feeling sick?
 - Probe: What factors do you think influenced their decision?
- 2b. What happens if they tell their supervisor? What if they are sent home?

- Probe: How do you think they would feel about that outcome?

Scenario 5

Part 1: If a worker notices something that may be a food safety hazard (or create a “food contamination” problem), they are to report the issue to their supervisor or someone who knows how to correct the situation. Sometimes workers see these issues, however, but do not report them to a supervisor.

- Why do you think a worker, or you or a coworker of yours, might do this? Or feel UNABLE to follow these directions?
- Are there any other factors that may influence the decision not to report an issue to a supervisor?

Scenario 6 – Other

Part 1: Are there any other things or experiences in the food workplace that impact a worker’s ability to handle food according to “food safety procedures” or handle food safely?

Any other changes that could be made to support food workers handle food safely on the job? Meet these “requirements”?

Thank you!

Appendix 7: Stakeholder Recruitment Script

[To be sent via email to worker advocate contacts or other leadership at select organizations.] Dear [Dr./Mr./Ms. _],

Hello! My name is Megan Clayton and I am a doctoral candidate at the Johns Hopkins Bloomberg School of Public Health. I am writing to invite you to participate in my dissertation on food work standards and food safety. *[If I have a contact: I received your name from X, who thought my work aligned with the mission of your organization and encouraged me to contact you.]*

I hope to learn about the challenges faced by food workers, such as poor working conditions, and to hear your thoughts on talking about these issues as related to food safety.

Participation involves a 40-60 minute interview and can occur in person or by phone. To be eligible for the study, one must be:

- Age 18 or older
- Fluent in English
- Informed about one's organizational mission and work strategies (e.g., educational, policy, and/or advocacy efforts)
- Informed about the challenges faced by the food worker population served

We would talk about your organization's mission, challenges faced by food workers, and your thoughts on talking about food work standards as related to food safety/risk (you do not have to have in-depth knowledge about food safety). Information collected during interviews will be confidential; I will not release any information that may be linked to you.

If you or a colleague would like to participate, or if you have questions, please contact me at MClayton@jhsph.edu or (301)-980-7598. I look forward to hearing from you!

Sincerely,

Megan

Megan L. Clayton, MPH
PhD Candidate, Department of Health, Behavior and Society
Center for a Livable Future (CLF) Doctoral Fellow
Johns Hopkins Bloomberg School of Public Health
301-980-7598; MClayton@jhsph.edu

JHSPH IRB#5187

Study Title: A Qualitative Exploration of the Role of Food Workers in U.S. Food Safety

Appendix 8: Stakeholder Interview Guide

Thank you for speaking with me today. The questions I am going to ask do not have right or wrong answers. First, I will ask basic questions about the work of your organization. Second, though food safety may not be a central part of your work, we will discuss your thoughts on talking about food working conditions as a food safety issue.

Organization Work and Focus

1. What is the purpose of your organization?
 - a. What is the mission?
2. Who are the workers that you serve?
3. What are the most important issues facing the workers that you serve?
 - a. How do these challenges play out in the workplace?
4. How does your organization work to address these issues? What are your strategies?

Linking Food Work Standards to Food Safety

Now we will talk about food working conditions (or standards) as issues of food safety. For example, in addition to talking about issues such as lack of access to living wages and paid sick days as issues of social injustice, we may also talk about them as conditions that put the U.S. food supply at risk.

1. Does your organization talk about these challenges as a food safety issue?
 - a. Do you think your members would be interested? Why or why not?
 - b. Would you anticipate push back? What would that look like?
2. If you know of other groups doing this, what are your thoughts on it?
 - a. How are they doing it?

Challenges of Linking Issues of Food Work to Food Safety

1. What are the challenges and/or consequences of framing the food work discussion from a food safety perspective?

Opportunities for Linking Issues of Food Work to Food Safety

1. What opportunities do you see in framing the food work discussion from a food safety perspective?
 - a. What *overall* opportunities do you see?

- b. What opportunities do you see for addressing above-mentioned issues?
- 2. Specifically, considering the advocacy strategies and activities that you are familiar with, can you tell me about how you might balance supporting food workers and talking about issues of food risk and safety?
 - a. How might we frame messages to empower and protect and support workers?
 - i. How would you talk about the issue? What would you say and what wouldn't you say?
 - b. To whom and/or where would you talk about the issue?
- 3. Is there anything else that you think is relevant to this conversation that I haven't asked?

Appendix 9: IRB Determination of Exemption (Initial Application and Amendment)

Initial Determination

#00000287

JHSPH Institutional Review Board Office

615 N. Wolfe Street / Suite E1100
Baltimore, Maryland 21205
Office Phone: (410) 955-3193
Toll Free: 1-888-262-3242
Fax Number: (410) 502-0584
E-mail Address: irboffice@jhsphe.edu
Website: www.jhsphe.edu/irb

INITIAL APPLICATION EXEMPT DETERMINATION NOTICE

Date: July 15, 2013

To: Katherine
Clegg Smith,
Ph.D. (Megan
Clayton)
Department of Health Behavior & Society

Re: Study Title: “A Qualitative Investigation of the Role of Food Workers in U.S. Food Safety”

IRB No: 00005187

The JHSPH IRB reviewed the above-referenced new application on **July 8, 2013**. We have determined that the human subjects research activity described in your application meets the criteria for Exemption under 45 CFR 46.101(b), Category (2). This study will use Medicare and nursing home Minimum Data Set information that will be de-identified by ResDAC before it is delivered to the investigators.

This determination is inclusive of the following documentation:

- **Research Plan (V4, 7/10/13)**
- **Oral Consent Script – Food Worker Advocate (V2, 7/10/13)**
- **Oral Consent Script – Food Workers (V2, 7/10/13)**
- **Interview Guide - Food Worker (V2, 7/10/13)**
- **Interview Guide - Food Worker Advocates (V2, 7/10/13)**
- **Interview Participant Questionnaire (V1, 7/8/13)**
- **Recruitment Script – Food Worker Advocate V1, 7/10/13)**

- **Recruitment Script – Food Processing Worker (V1, 7/10/13)**
- **Recruitment Script – Food Service Worker (V1, 7/10/13)**

Any change to the research activity must be submitted to the IRB before implementation to ensure that it does not change the Exempt determination. The IRB does not require continuing review or submission of a progress report for studies determined as exempt from federal regulations. Every three (3) years from the date of exempt determination, you will be contacted for an update on whether or not to keep the exempt study active in our records.

Amendment Determination

Date: January 16, 2014

To: Katherine
Clegg Smith,
PhD (Megan
Clayton)
Department of Health, Behavior & Society

Re: **Amendment to Exempt Study:** “A Qualitative Investigation of the Role of Food Workers in U.S. Food Safety”
IRB No: 00005187

The JHSPH IRB reviewed your Amendment Application (received on 1/7/14), for the above referenced study, and determined on **January 10, 2014** that the proposed changes listed below and described in the Amendment Application will not alter the Exempt determination.

1. To revise the research plan for phase 2 of the study to include information about giving participants \$20.00 cash instead of \$20 gift cards to thank them for their time.
2. To make some editorial changes to the food worker recruitment scripts about giving participants \$20.00 cash instead of \$20 gift cards, and make some editorial changes to the language to enhance the clarity of the recruitment scripts.
3. To make some editorial changes to the food worker advocate recruitment script to help potential participants better understand the purpose of the study, the details of their involvement, and to improve the transparency and precision of script content.

This determination is inclusive of the following documentation:

- **Research Plan (V5, 1/7/14)**
- **Food Worker Advocate Recruitment Script (V2, 1/7/14)**
- **Food Service Worker Recruitment Script (V2, 1/7/14)**
- **Food Processing Worker Recruitment Script (V2, 1/7/14)**

Therefore, the human subjects research activity continues to meet the criteria for Exemption under 45 CFR 46.101(b), Category (2). The Exempt determination date for this study remains **July 8, 2013**.

Any change to the research activity must be submitted to the IRB before implementation to assure that it does not change the Exempt determination. Otherwise, no further IRB review is required.

Appendix 10: IRB Oral Consent Script: Food Workers and Stakeholders

FOOD WORKERS - ORAL CONSENT SCRIPT

Before we begin, I'd like to go over some information with you. If you have any questions, please let me know.

You are being asked to join a research study. This study is being done to learn about the relationship between food work and food safety. You are asked to be in this study because you work in a job in [food service/food processing]. If you agree to be in this study, I will interview you for 40 to 60 minutes. Before the interview, I will also ask you complete a one-page questionnaire that asks about your food job and for basic demographic information.

I will ask you questions about things like: what do you do in your job, what are your thoughts on what you or another person would do in situations related to food work and food safety. I would like to record this interview so I don't miss anything.

You will receive a \$20 for participating in the study. The risks to being a part of this study are minimal. There may be some questions that make you uncomfortable. The benefits to participating in this study are that you may enjoy sharing your experiences with me.

At any point, you can decline to answer any question, or stop the interview. Also, you can decline to have the interview recorded if you prefer. You will still receive \$20 cash if you decide to not record the interview, or if you choose not to answer some of the questions.

All of the information you share with me will be private. I won't ask about any personal information and will not identify you in any way on the recording or notes. The information that you share may be published in papers in the future, but you will not be identified individually in any way.

If you have any questions, concerns, or complaints about this study, please contact the study Principal Investigator, Kate Smith (410 502-0025).

If you have any questions about your rights as a research participant, or if you think you have not been treated fairly, you may call the Johns Hopkins School of Public Health Institutional Review Board (IRB) at 410-955-3193, or 1-888-262-3242

Do you have any questions? Would you like to participate in this study? (Indicate yes/no).

STAKEHOLDERS - ORAL CONSENT SCRIPT

Study: A Qualitative Investigation of the Role of Food Workers in U.S. Food Safety

Principal Investigator: Dr. Katherine Clegg Smith

IRB No.: #5187

PI Version/Date: V2; 07/10/2013

Before we begin, I'd like to go over some information with you. If you have any questions, please let me know.

You are being asked to join a research study. This study is being done to learn about the relationship between food work and food safety. You are asked to be in this study because you are a food worker advocate (or related group). If you agree to be in this study, then I will interview you for 40 to 60 minutes.

I will ask questions about things like: the work of your organization, opportunities and challenges in connecting working conditions to food safety, and ideas about how to discuss this topic in a way to support workers. I would like to record this interview so I don't miss anything.

The risks to being a part of this study are minimal. There may be some questions that make you uncomfortable. The benefits to participating in this study are that you may enjoy sharing your experiences with me. Also, the information you provide is in line with the goal of supporting the work and lives of food workers.

At any point, you can decline to answer a question, or stop the interview. You can also decline to have the interview recorded.

All of the information you share with me will be private. I won't ask about any personal information and will not identify you in any way on the recording or notes. The information that you share may be published in papers in the future, but you will not be identified individually in any way.

If you have any questions, concerns, or complaints about this study, please contact the study Principal Investigator, Kate Smith (410 502-0025). If you have any questions about your rights as a research participant, or if you think you have not been treated fairly, you may call the Johns Hopkins School of Public Health Institutional Review Board (IRB) at 410-955-3193 or 1-888-262-3242

Do you have any questions? Would you like to participate in this study? (Indicate yes/no)

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CURRICULUM VITAE

MEGAN L. CLAYTON, MPH

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EDUCATION

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| 2014 | PhD, Department of Health, Behavior and Society (Defense: Nov. 5, 2014)
The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
Dissertation: <i>A Qualitative Investigation of the Role of Food Workers in U.S. Food Safety</i> |
| 2010 | MPH, Social and Behavioral Sciences Concentration
The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
Capstone: <i>Carbon Emissions in the Supermarket: An Evaluation of the Creation, Use, and Implications of the UK Carbon Trust Carbon Reduction Label</i> |
| 2006 | BS, Marketing and Management; Bioethics Minor
University of Virginia, McIntire School of Commerce, Charlottesville, VA |

RESEARCH EXPERIENCE

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| 2012–present | <p><i>Research Assistant</i>, The Johns Hopkins Center for a Livable Future
The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD</p> <p>Applying qualitative research to investigate U.S. Food Policy Councils' policy work and to explore the potential to enhance food security in the Northeast through regional food systems as part of a USDA-funded Agriculture and Food Research Initiative (AFRI) project.</p> <ul style="list-style-type: none">• Created training manual and lead training seminars for research team members in 8 study locations in the Northeast U.S. to facilitate study implementation.• Developed materials for and conducted focus groups and surveys with residents of low-income Baltimore City neighborhoods to understand food purchasing behaviors and key barriers to healthy food access.• Gathered and compiled data for a community involvement plan to facilitate stakeholder engagement in the research process and products.• Participated as student member of a research team of faculty to develop, conduct, and publish qualitative research on the policy activities of U.S. Food Policy Councils.• Co-administered interviews with Food Policy Council leaders and policymakers across 11 U.S. states.• Managed large volumes of documents and research team notes, annotations, codes, and memos using Atlas.ti qualitative research software; provided technical support to resolve software problems for the team. |
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- Analyzed qualitative data to identify significant factors, including barriers and opportunities, to food policy council policy engagement; developed recommendations to guide FPCs' future food policy practices.
 - Served as primary author on a paper exploring the role of partnerships in advancing FPCs' policy engagement, currently under review at *PLoS One*.
- 2011 *Program Assistant*, Expanded Food and Nutrition Education Program
University of Maryland-Extension, Baltimore, MD
- Created *Baltimore City Community Food System Factsheet* to define a community food system with recommendations and resources for individual involvement; intended for limited-income communities with pre-existing interest in local food system issues.
- Prepared documents, guidance, and advisory correspondence among a variety of project participants, including EFNEP leadership, key issue stakeholders, and graphic designers.
 - Provided extensive literature review of existing resources; gathered information on action steps/resources to list in the factsheet.
 - Conducted interviews within residents and leaders in limited-income communities; synthesized interview data into recommendations for improving factsheet resource.
- 2009 *Public Policy Intern*, Public Policy Committee
Greater Washington Partnership for Palliative & End-of-Life Care, D.C.
- Examined access barriers to prescription pain medication for residents in limited-income Washington, D.C. neighborhoods
- Communicated with a variety of issue stakeholders, including pharmacies in low-income D.C. neighborhoods, to understand prescription opioid stocking policies and to help find solutions to improve access.
 - Translated findings for and developed policy recommendations with the Director of the American Bar Association's Commission on Law & Aging.
- 2004 *Research Intern*, Children's Bioethics Centre
Murdoch Children's Research Institute (MCRI), Melbourne, Australia
- Engaged in research, education, and the stimulation of public discussion around the ethical issues associated health, professional sport, and technological advancement.
- Developed ethical arguments for and co-authored peer-reviewed article on why we should allow performance enhancing drugs in professional sport; performed extensive research for article foundation and framework.

PROFESSIONAL EXPERIENCE

- 2006-2008 *Hospital Services & Professional Education Specialist*
Washington Regional Transplant Community, Annandale, VA
- Represented federally-designated Organ Procurement Organization (OPO) for 43 Maryland, Virginia, and Washington, D.C. hospitals.
- Responded to organ donation on-call, 24 hours/day, 10 days/month.
 - Maximized donor identification, approach, and recovery for 18 hospitals.
 - Gave weekly presentations about donation; received top audience scores.
 - Transformed top Prince George's County, Maryland hospital donation rate (actual/potential donors) from 17% to unprecedented 100%.
 - Implemented Donation after Cardiac Death (DCD) policies to increase donations.

TEACHING AND MENTORING EXPERIENCE

- 2013-2014 *Capstone Advisor*, The Johns Hopkins Master of Public Health Department
One of 6 doctoral candidates identified by faculty and MPH Program Chair to guide MPH student Capstone development and analysis.
- 2012-2013 *Co-Instructor*, Baltimore Food Systems: A Case Study in Urban Food Environments; Department of Environmental Health Sciences; The Johns Hopkins Center for a Livable Future
- Assisted in engaging students in experiential learning, discussion, service learning, and related texts to critically examine the Baltimore City food environment; helped to organize tours of supermarkets, emergency food centers, urban and rural farms, and an aquaponics facility.
 - As co-instructor, I received "excellent" ratings on student evaluations: presentations (*engaging, useful, great speaker*), facilitating discussions, feedback (*timely, responsive, thoughtful*), attitude (*friendly, approachable, charismatic*), and course organization (*logistical hero*).
- 2013- present *Teaching Assistant*, Sociological Perspectives on Public Health
The Department of Health, Behavior and Society
- 2013 *Teaching Assistant*, Tools of Public Health Practice and Decision Making
The Department of Health Policy and Management
- 2011-2012 *Teaching Assistant*, Baltimore Food Systems: A Case Study in Urban Food Environments; Department of Environmental Health Sciences; The Johns Hopkins Center for a Livable Future
- 2011-2014 *Doctoral Student Coordinator*, JHSPH MPH Concentration in Social and Behavioral Sciences;
- Coordinated and led seminars; mentored students on coursework and capstone projects; lectured on public speaking and professional presentation skills.

FELLOWSHIPS, HONORS, AND AWARDS

2010-2014	Center for a Livable Future-Lerner Fellowship <ul style="list-style-type: none">• Fellowship requires competitive interview and assessment; students must recompete annually.
2013, 2014	Doctoral Distinguished Research Award Recipient
2012	Special Doctoral Student Funding Award Recipient
2011	Food & Environment Working Group Scholarship Recipient, APHA
2006	Independent Student Arts Fund Grant Recipient
2005-2006	Bank of America Scholarship, Scholastic Merit
2004–present	Phi Eta Sigma Honor Fraternity
2003–present	National Society of Collegiate Scholars

PUBLICATIONS AND PRESENTATIONS

Textbook Sections and Reports:

Food System Workers at Risk

Neff R.A. & **Clayton M.** (2014). In Neff RA (Ed.), *Introduction to the U.S. Food System: Public Health, Environment, Equity*. Wiley-Jossey Bass.

Why We Should Allow Performance Enhancing Drugs in Sport, republished in:

Levine, C. (2006). *Taking Sides: Clashing Views on Controversial Bioethical Issues*. Iowa: McGraw-Hill

Community Food Security in the U.S. Part II: A Survey of the Relevant Scientific Literature
Chen, W., **Clayton, M.**, & Palmer, A. (2014) The Johns Hopkins Center for a Livable Future.

Journal Articles:

Why We Should Allow Performance Enhancing Drugs in Sport

Savulescu, J., Foddy, B., **Clayton, M.** (2004). *Br J Sports Med* 2004;38:666-670

The Role of Partnerships in U.S. Food Policy Council Policy Activities

Clayton, M., Frattaroli, S., Palmer, A., & Pollack, K. (2014). *Under review at PLoS One*.

In Progress:

Impacts of Urban Agriculture on Food Insecurity: A Systematic Literature Review

Poulsen, M., McNab, P., & **Clayton, M.**

Presentations:

Qualitative Interviewing: Learning through Listening

Clayton, M. (2014, November 18). *Concepts in Qualitative Research*

Lecture conducted from The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.

Labor in the Food System

Clayton, M. (2014, October 24). *5th Annual 100 Mile Meal, Real Food Hopkins*.

Presentation conducted from the Johns Hopkins University Homewood Campus, Baltimore, Maryland.

An Investigation of the Legally-Constructed Role of Food Workers in U.S. Food Safety

Clayton, M. (2014, August, 16). Paper presented at *The American Sociological Association Annual Meeting*, San Francisco, CA.

Qualitative Research Methods for Oral History Research Projects

Clayton, M. (2014, January 29). *Baltimore Food Systems: A Case Study in Urban Food Environments*. Lecture conducted from The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.

Public Speaking Skills

Clayton, M. (2012-2014). *MPH Concentration in Social and Behavioral Sciences Seminar*
Lecture conducted from The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.

- Consistently ranked as a favorite lecture in student seminar evaluations.

OTHER EXPERIENCE

2014	<i>Certificate of Accomplishment</i> , Coursera University-Level Teaching 101 The Johns Hopkins Bloomberg of Public Health, Baltimore, MD
2011-2012	<i>Fellowship Journal Club Coordinator</i> , Johns Hopkins Center for a Livable Future The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
2010-2012	<i>Volunteer</i> , The Ark (State-Accredited Preschool for Homeless Children) Episcopal Community Services of Maryland, Baltimore, MD <ul style="list-style-type: none">• Provided care, attention, and the delivery of education to support development among children 3 and 4-years old whose families were homeless or in the early stages of addiction recovery.